

Analysis of morbidity data from Greece for the five leading causes of unintentional injury death among elderly in EU25

The purpose of this report is to present proportional indicators for 5 causes of unintentional injuries among the elderly (65+ years) in Greece. These causes were chosen based on their highest ranking among all causes of injury mortality in the EU25. The indicators presented could potentially be applied for other EU countries as well, provide a basis for comparisons between them and ultimately assist in the identification of appropriate prevention measures.

Data retrieved from the Emergency Department Injury Surveillance System (EDISS) database, developed by the Center for Research and Prevention of Injuries (CEREPRI), were used to study the pattern of

- fall injuries
- road traffic injuries
- burn injuries due to fire, flames and contact with hot objects
- accidental poisonings
- accidental drowning and near-drowning injuries

among elderly (65+ years old) in Greece.

These 5 categories of injuries account for the highest numbers of deaths due to unintentional injuries among elderly in EU25 as can be seen in the following table.

Average number of unintentional injury deaths among elderly (65+) in EU25 (excluding countries with population <1,000,000) of the last 3 available years, by cause of death.

Cause of death	N
<i>Accidental falls</i>	39600
<i>Motor vehicle traffic</i>	10486
<i>Smoke fire and flames</i>	1585
<i>Accidental poisoning total</i>	1583
<i>Accidental drowning and submersion</i>	1385
Environmental factors	944
Transport non motor vehicle	845
Machinery cutting piercing instruments	228
Firearm missile	43
Other or unspecified injury	21303
Total	78002

(Source: Injury Statistics Portal, http://www.euroipn.org/stats_portal/ utilizing data from the WHO mortality database)

All types of elderly injuries treated at the Emergency Departments (ED) of a network of three participating hospitals are regularly recorded in EDISS. Specifically, data are contributed by two hospitals with defined population coverage, namely the district hospital of Volos in the Magnesia region of the Greek mainland and the district hospital of Kerkyra on the island of Corfu. The cases, which are recorded in these two hospitals, cover about 2.2% of injuries in Greece excluding the Greater Athens Area. The other hospital, namely Asclipeion of Voula Trauma hospital is situated in the Greater Athens area and cover about 2.2% of the ED visits of the underlying elderly population.

Specially trained health visitors interviewed in person the injured person who visited the ED or their escort; this personnel is supervised by physicians. The working schedule covers the time period 7 a.m. to 11 p.m. Information on injuries happening during the night is based on outpatient records. The data are recorded in a pre-coded questionnaire, which covers socio-demographic variables (gender, age, nationality), event characteristics (place, activity, mechanism, time) and nature of injury (type of injury, injured body part, number of injuries, treatment). Particularly for road traffic injuries a specially prepared questionnaire is filled in which includes information about the vehicles involved, the type of road user, the type of collision, weather, road and lighting conditions, possible cause of accident, use of helmet and seatbelt and possession of driving license. The data are subsequently coded in detail under ICD-9, ICD-10 and the European Home and Leisure Accident Surveillance System (EHLASS) coding manuals.

During the eight year period 1996-2003, a total of 37224 home and leisure injuries and 3357 road traffic injuries among elderly (65+) were recorded by EDISS.

Fall related injuries among elderly in Greece

During the eight year period 1996-2003, a total of 30694 fall related home and leisure injuries among elderly (65+) were recorded by EDISS accounting for 82.5% of the total home and leisure injuries among elderly.

Demographic characteristics

The majority of fall related injuries concerned females (72%) with no significant differences among age groups (Table 1) while among all other home and leisure injuries males up to 74 years old outnumbered females (52% vs. 48%) whereas for ages 75+ the pattern is reversed (46% vs. 54%). Furthermore, among fall related injuries, about 32% concern ages 80+ whereas among other injuries only 14% (data not shown).

Event characteristics

Most of the falls (70%) occurred at the same level mostly due to stumbling (37%) or slipping (27%). Falls from greater height account for 26% of the total falls. More specifically, 5% and 4% of the injuries occurred after a fall from a bed or chair respectively, falls from stairs/ladder account for 14% of the injuries and 3% occurred from other height. For 2% of the total injuries due to fall the mechanism was fall in/from vehicles and in another 2% the mechanism was unknown. Concerning age, the percent of the injured persons due to fall from stumbling increases with age whereas falls due to slipping decrease by age. Falls from bed or chair are more frequent in the age group 85+ years (13% and 6% respectively). In contrast, falls from stairs/ladder and from other height are more common among the younger ages (65-74 years) (Table 2).

Home inside is the most common place where falls occurred (40%). More specifically, the bedroom accounts for 12% of the injuries but the percentage is increasing with age and reaches 26% among the age group 85+ years. The kitchen accounts for 7% and the bathroom for 5% of the cases. Injuries which occurred around the house account for 25%. One out of 5 injuries occurred on the road or pavement. A small number of cases (3%) occurred in farm areas mostly among men and younger ages. Another 3% occurred in commercial and service areas. Finally 3% occurred at hospitals and nursing homes and become more common as the age increases (Table 3).

The proportion of slipping was higher in the bathroom (64%) whereas the proportion of stumbling was higher on the road/pavement (54%). Falling from bed, apart from the bedroom, is also common in hospitals and nursing homes (21%). Falls from chair occur more often in the kitchen (24%). Falls from stairs or ladder are more frequent in home other and around (32% and 26% respectively) and in commercial and service areas (32%). Falls from other height are more common in farm areas (25%) (Table 5).

There were no significant differences observed between the days and the seasons either by age group or gender. About one out of three injuries occurred during 10:00

and 13:59 and 18% in the morning between 6:00 and 9:59. However, injuries early in the morning and late in the evening and night become more common among 85+ years old (data not shown).

Injury characteristics

Almost half of the injuries were fractures, they were more common among females (51% vs. 38%, Table 6) and ranged from 42% for the age group 65-74 years old to 59% for the age group 85+ years old (Table 7). Most of them were located in the hip/upper leg (39% of fractures) but the proportion was even higher among older ages (85+: 67% of fractures) (Table 9). Another 40% of the fractures were located in the upper limbs, especially the forearm (21% of all body parts), and this was more common among younger ages (65-74: 52%, Table 9). The mechanisms which caused proportionally the most fractures are fall from bed (59%), fall from chair (52%) and stumbling (52%) (Table 10) mostly in the road and around the house (data not shown). Concussions accounted for 6% of the cases. There were no significant differences among age groups and gender. About one in three occurred after fall from height (649 of 1843, Table 10). The remaining injuries are contusion, bruises and superficial wounds (30%), open wounds (8%), sprains and dislocations (7%) (Table 6). About 40% of the injuries were located to the lower limbs, 30% to the upper limbs, 15% to the trunk and 15% to the head (Table 8).

The proportion of hospitalized elderly persons (26% overall) ranges from 16% for the age group 65-74 to 44% for the age group 85+. Similarly, the median length of stay in the hospital was 9 days for the age group 65-74 and reached 14 days for the age group 85+ (Table 11). The mechanism with the proportionally highest rate of hospitalization (47%) was fall from bed (Table 12).

There were 90 deaths recorded (0.3%) of which almost half (44) concerned people over 85 years old (Table 11). In 66 of the deaths (73%) the main injury was fracture to the hip (58) or the upper leg (8) and for another 14 deaths (16%) the injury was located to the brain (data not shown). Most of the deaths were caused by stumbling (29), slipping (25) and fall from height (28). However, the mechanism with the highest rate of death was fall from other height (0.9%, all from buildings) (Table 12).

Table 1: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by age and gender

Gender	Age						Total	
	65-74		75-84		85+		N	col %
Male	4365	29.2	2985	27.3	1392	28.8	8742	28.5
Female	10575	70.8	7931	72.7	3446	71.2	21952	71.5
Total	14940	100.0	10916	100.0	4838	100.0	30694	100.0

Table 2: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by mechanism of fall and age group

Mechanism of fall	Age						Total	
	65-74		75-84		85+		N	col %
<i>In/from vehicle</i>	311	2.1	172	1.6	30	0.6	513	1.7
<i>On the same level</i>	10411	69.7	7826	71.7	3360	69.5	21597	70.4
stumbling	5148	34.5	4222	38.7	1972	40.9	11342	37.0
slipping	4586	30.7	2832	25.9	999	20.6	8417	27.4
other on the same level	677	4.5	772	7.1	389	8.0	1838	6.0
<i>From height</i>	4026	26.9	2747	25.1	1345	27.8	8118	26.4
from bed	342	2.3	671	6.1	623	12.9	1636	5.3
from chair	581	3.9	468	4.3	273	5.6	1322	4.3
from stairs/ladder	2588	17.3	1412	12.9	392	8.1	4392	14.3
other height	515	3.4	196	1.8	57	1.2	768	2.5
<i>Unknown</i>	192	1.3	171	1.6	103	2.1	466	1.5
Total	14940	100.0	10916	100.0	4838	100.0	30694	100.0

Table 3: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by place and age group

Place of fall	Age						Total	
	65-74		75-84		85+		N	col %
	N	col %	N	col %	N	col %	N	col %
Inside the house	4673	31.4	4765	43.6	2898	59.9	12336	40.2
<i>Bedroom</i>	922	6.2	1581	14.5	1267	26.2	3770	12.3
<i>Kitchen</i>	937	6.3	746	6.8	370	7.6	2053	6.7
<i>Bathroom</i>	592	4.0	573	5.2	315	6.5	1480	4.8
<i>Other inside the house</i>	2222	14.9	1865	17.1	946	19.6	5033	16.4
Around the house	4118	27.5	2581	23.6	962	19.9	7661	25.0
Road, pavement	3954	26.4	2222	20.4	476	9.8	6652	21.7
Farm area	557	3.7	200	1.8	21	0.4	778	2.5
Hospital or nursing home	217	1.5	367	3.4	284	5.9	868	2.8
Commercial and service areas	511	3.4	348	3.2	61	1.3	920	3.0
Other or unspecified	910	6.1	433	4.0	136	2.8	1479	4.8
Total	14940	100.0	10916	100.0	4838	100.0	30694	100.0

Table 4: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by mechanism and place (absolute numbers only)

Mechanism of fall	Place of fall											Total
	Inside the house	Other inside the house				Around the house	Road, pavement	Farm area	Hospital or nursing home	Commercial & service areas	Other/Unspec.	
		Bed-room	Kitchen	Bath-room	Other inside the house							
N	N	N	N	N	N	N	N	N	N	N	N	
<i>In/from vehicle</i>	0	0	0	0	0	7	325	30	2	0	149	513
<i>On the same level</i>	7954	2158	1473	1439	2884	5211	6060	499	514	595	764	21597
<i>stumbling</i>	3973	1362	644	316	1651	2546	3607	242	254	318	402	11342
<i>slipping</i>	2984	495	664	950	875	2367	2109	246	198	210	303	8417
<i>other on the same level</i>	997	301	165	173	358	298	344	11	62	67	59	1838
<i>From height</i>	4310	1592	576	35	2107	2432	234	248	318	320	257	8119
<i>from bed</i>	1429	1328	4	0	97	5	0	0	181	7	14	1636
<i>from chair</i>	1024	176	497	7	344	186	9	1	57	12	33	1322
<i>from stairs/ladder</i>	1764	71	54	13	1626	1992	85	52	72	293	134	4392
<i>other height</i>	93	17	21	15	40	248	140	195	8	8	76	768
<i>Unknown</i>	72	20	4	6	42	12	33	1	34	5	309	466
Total	12336	3770	2053	1480	5033	7661	6652	778	868	920	1479	30694

Table 5: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by mechanism and place (column percent only)

Mechanism of fall	Place of fall											Total col %
	Inside the house col %	Other inside the house				Around the house col %	Road, pavement col %	Farm area col %	Hospital or nursing home col %	Commercial & service areas col %	Other/ Unspec. col %	
		Bed- room col %	Kitchen col %	Bath- room col %	Other col %							
<i>In/from vehicle</i>	0.0	0.0	0.0	0.0	0.0	0.1	4.9	3.9	0.2	0.0	10.1	1.7
<i>On the same level</i>	64.5	57.2	71.8	97.2	57.4	68.0	91.1	64.1	59.2	64.7	51.7	70.4
stumbling	32.2	36.1	31.4	21.4	32.9	33.2	54.2	31.1	29.3	34.6	27.2	37.0
slipping	24.2	13.1	32.4	64.1	17.4	30.9	31.7	31.6	22.8	22.8	20.5	27.4
other on the same level	8.1	8.0	8.0	11.7	7.1	3.9	5.2	1.4	7.1	7.3	4.0	6.0
<i>From height</i>	34.9	42.3	28.0	2.4	41.8	31.7	3.5	31.9	36.7	34.8	17.3	26.4
from bed	11.6	35.2	0.2	0.0	1.9	0.1	0.0	0.0	20.9	0.8	0.9	5.3
from chair	8.3	4.7	24.2	0.5	6.8	2.4	0.1	0.1	6.6	1.3	2.2	4.3
from stairs/ladder	14.2	1.9	2.6	0.9	32.3	26.0	1.3	6.7	8.3	31.8	9.1	14.3
other height	0.8	0.5	1.0	1.0	0.8	3.2	2.1	25.1	0.9	0.9	5.1	2.5
<i>Unknown</i>	0.6	0.5	0.2	0.4	0.8	0.2	0.5	0.1	3.9	0.5	20.9	1.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 6: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by type of injury and gender

Type of injury	Gender				Total	
	Male		Female			
	N	col %	N	col %	N	col %
Concussion	642	7.3	1201	5.5	1843	6.0
Contusion, bruise, abrasion	3022	34.6	6311	28.7	9333	30.4
Open wound	1143	13.1	1449	6.6	2592	8.4
Fracture	3291	37.7	11237	51.2	14528	47.4
Dislocation, sprain	502	5.7	1537	7.0	2039	6.6
No injury	96	1.1	171	0.8	267	0.9
Other or unspecified	46	0.5	46	0.2	92	0.3
Total	8742	100.0	21952	100.0	30694	100.0

Table 7: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by type of injury and age group

Type of injury	Age						Total	
	65-74		75-84		85+			
	N	col %	N	col %	N	col %	N	col %
Concussion	832	5.6	701	6.4	310	6.4	1843	6.0
Contusion, bruise, abrasion	5138	34.3	3127	28.7	1068	22.1	9333	30.4
Open wound	1179	7.9	976	8.9	437	9.0	2592	8.4
Fracture	6273	42.0	5406	49.6	2849	58.9	14528	47.4
Dislocation, sprain	1342	9.0	573	5.2	124	2.6	2039	6.6
No injury	121	0.8	108	1.0	38	0.8	267	0.9
Other or unspecified	55	0.4	25	0.2	12	0.2	92	0.3
Total	14940	100.0	10916	100.0	4838	100.0	30694	100.0

Table 8: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by part of body and type of injury

Part of body	Type of injury														Total	
	Concussion		Contusion bruise, abrasion		Open wound		Fracture		Dislocation, sprain		No injury		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %	N	col %	N	col %	N	col %	N	col %
<i>Head</i>	1843	100.0	477	5.1	1916	73.9	108	0.7	0	0.0	129	48.4	22	23.9	4495	14.7
Brain, skull	1843	100.0	208	2.2	848	32.7	18	0.1	0	0.0	122	45.8	20	21.7	3059	10.0
Head other	0	0.0	269	2.9	1068	41.2	90	0.6	0	0.0	7	2.6	2	2.2	1436	4.7
<i>Trunk</i>	0	0.0	3380	36.2	11	0.4	1113	7.7	80	3.9	77	28.8	32	34.8	4693	15.3
<i>Upper limb</i>	0	0.0	2212	23.7	369	14.3	5776	39.7	894	43.8	29	10.9	17	18.4	9297	30.3
Forearm	0	0.0	213	2.3	61	2.4	3108	21.4	0	0.0	1	0.4	0	0.0	3383	11.0
Upper arm, shoulder	0	0.0	1171	12.5	6	0.2	1718	11.8	665	32.6	20	7.5	5	5.4	3585	11.7
Upper limb other	0	0.0	828	8.9	302	11.7	950	6.5	229	11.2	8	3.0	12	13.0	2329	7.6
<i>Lower limb</i>	0	0.0	3264	35.0	296	11.4	7531	51.9	1065	52.3	32	11.9	21	22.9	12209	39.7
Hip, upper leg	0	0.0	1158	12.4	7	0.3	5678	39.1	28	1.4	14	5.2	2	2.2	6887	22.4
Lower limb other	0	0.0	2106	22.6	289	11.1	1853	12.8	1037	50.9	18	6.7	19	20.7	5322	17.3
Total	1843	100.0	9333	100.0	2592	100.0	14528	100.0	2039	100.0	267	100.0	92	100.0	30694	100.0

Table 9: Distribution of the 14528 fractures due to fall among elderly (65+), recorded in Greece by EDISS during 1996-2003, by part of body and age group

Part of body	Age						Total	
	65-74		75-84		85+		N	col %
	N	col %	N	col %	N	col %	N	col %
<i>Head</i>	52	0.9	38	0.7	18	0.7	108	0.7
Brain, skull	10	0.2	6	0.1	2	0.1	18	0.1
Head other	42	0.7	32	0.6	16	0.6	90	0.6
<i>Trunk</i>	485	7.7	424	7.8	204	7.2	1113	7.7
<i>Upper limb</i>	3242	51.6	1930	35.7	604	21.2	5776	39.7
Forearm	1838	29.2	976	18.1	294	10.3	3108	21.4
Upper arm, shoulder	815	13.0	672	12.4	231	8.1	1718	11.8
Upper limb other	589	9.4	282	5.2	79	2.8	950	6.5
<i>Lower limb</i>	2494	39.8	3014	55.8	2023	70.9	7531	51.9
Hip, upper leg	1265	20.2	2511	46.5	1902	66.7	5678	39.1
Lower limb other	1229	19.6	503	9.3	121	4.2	1853	12.8
Total	6273	100.0	5406	100.0	2849	100.0	14528	100.0

Table 10: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by type of injury and mechanism of fall

Mechanism of fall	Type of injury														Total	
	Concussion		Contusion bruise, abrasion		Open wound		Fracture		Dislocation sprain		No injury		Other/ Unspec.			
	N	row %	N	row %	N	row %	N	row %	N	row %	N	row %	N	row %	N	row %
<i>In/from vehicle</i>	48	9.4	188	36.6	71	13.8	156	30.4	40	7.8	8	1.6	2	0.4	513	100.0
<i>On the same level</i>	1037	4.8	6491	30.1	1783	8.3	10618	49.2	1435	6.6	183	0.8	50	0.2	21597	100.0
<i>stumbling</i>	414	3.6	3291	29.0	929	8.2	5870	51.8	742	6.5	75	0.7	21	0.2	11342	100.0
<i>slipping</i>	310	3.7	2777	33.0	584	6.9	4002	47.5	636	7.6	89	1.1	19	0.2	8417	100.0
<i>other on the same level</i>	313	17.0	423	23.0	270	14.7	746	40.7	57	3.1	19	1.0	10	0.5	1838	100.0
<i>From height</i>	649	8.0	2502	30.8	674	8.3	3646	44.9	546	6.7	71	0.9	30	0.4	8118	100.0
<i>from bed</i>	106	6.5	402	24.6	90	5.5	958	58.6	61	3.7	17	1.0	2	0.1	1636	100.0
<i>from chair</i>	92	7.0	378	28.6	92	7.0	684	51.6	61	4.6	13	1.0	2	0.2	1322	100.0
<i>from stairs/ladder</i>	346	7.9	1482	33.8	443	10.1	1717	39.0	357	8.1	31	0.7	16	0.4	4392	100.0
<i>other height</i>	105	13.7	240	31.3	49	6.4	287	37.3	67	8.7	10	1.3	10	1.3	768	100.0
<i>Unknown</i>	109	23.4	152	32.6	64	13.7	108	23.2	18	3.9	5	1.1	10	2.1	466	100.0
Total	1843	6.0	9333	30.4	2592	8.4	14528	47.4	2039	6.6	267	0.9	92	0.3	30694	100.0

Table 11: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by outcome and age group. Median length of stay in hospital by age group also included.

Outcome	Age						Total	
	65-74		75-84		85+		N	col %
	N	col %	N	col %	N	col %	N	col %
Examined	916	6.1	687	6.3	228	4.7	1831	6.0
Treated	3825	25.6	2311	21.2	794	16.4	6930	22.6
Treated & followed up	7741	51.9	4636	42.5	1627	33.6	14004	45.6
Hospitalized	2439	16.3	3255	29.8	2145	44.4	7839	25.5
Deceased	19	0.1	27	0.2	44	0.9	90	0.3
Total	14940	100.0	10916	100.0	4838	100.0	30694	100.0
Median length of stay	9		13		14		12	

Table 12: Distribution of the 30694 fall injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by outcome and mechanism of fall

Mechanism of fall	Outcome										Total	
	Examined		Treated		Treated & followed up		Hospitalized		Deceased		N	row %
	N	row %	N	row %	N	row %	N	row %	N	row %	N	row %
<i>In/from vehicle</i>	37	7.2	173	33.7	196	38.2	106	20.7	1	0.2	513	100.0
<i>On the same level</i>	1232	5.7	4760	22.0	10159	47.1	5387	24.9	59	0.3	21597	100.0
stumbling	544	4.8	2351	20.7	5450	48.0	2968	26.2	29	0.3	11342	100.0
slipping	513	6.1	2005	23.8	4023	47.8	1851	22.0	25	0.3	8417	100.0
other on the same level	175	9.5	404	22.0	686	37.3	568	30.9	5	0.3	1838	100.0
<i>From height</i>	503	6.2	1792	22.1	3527	43.5	2268	27.9	28	0.3	8118	100.0
from bed	74	4.5	315	19.3	474	29.0	763	46.6	10	0.6	1636	100.0
from chair	71	5.4	276	20.9	572	43.2	398	30.1	5	0.4	1322	100.0
from stairs/ladder	282	6.4	972	22.1	2245	51.2	887	20.2	6	0.1	4392	100.0
other height	76	9.9	229	29.8	236	30.8	220	28.6	7	0.9	768	100.0
<i>Unknown</i>	59	12.7	205	44.0	122	26.2	78	16.7	2	0.4	466	100.0
Total	1831	6.0	6930	22.6	14004	45.6	7839	25.5	90	0.3	30694	100.0

Road traffic injuries among elderly in Greece

During the eight year period 1996-2003, a total of 3357 road traffic injuries among elderly (65+) were recorded by EDISS.

All road users

Of the total 3357 road traffic injuries among elderly recorded by EDISS, 1318 (39%) were pedestrians, 1310 (39%) were drivers, 564 (17%) were passengers and 165 (5%) were unspecified road users. (Table 1)

About 22% of the injuries occur to motorcycle occupants and 23% to car occupants but the proportions decrease with age. (Table 2)

With regard to gender, women are more frequently injured as pedestrians than men (57% vs. 30%), and as passengers either in car or on motorcycle. Males on the other hand are mostly injured as drivers. (Table 3)

The most severe injuries occurred among pedestrians as 32% of them were hospitalized, 3.3% deceased and the median length of stay in hospital was 5 days. Among bicycle occupants, 30% were hospitalized, 2.2% deceased and the median length of stay was 3 days. The hospitalization percentage of car occupants was similar (31%) but the rest of the respective numbers for both car and motorbike occupants were smaller (Table 4).

Pedestrians

During the years 1996-2003 a total of 1318 elderly pedestrians were recorded by EDISS.

As expected, among all road users, the proportion of pedestrians gets higher as the age progresses and reaches as high as 74% among the age group 85+ (Table 2). Under the age of 75 it is females who are mostly injured as pedestrians whereas over 75 years it is mostly men especially among the age group 85+ (Table 5).

About 32% of the injured pedestrians stated that they crossed the road without checking and this becomes more common as the age progresses. Another 19% stated that they were not able to estimate correctly the traffic situation. For another 13%, the victims were injured while walking along the street and not using the pavement. 6% were hit by a vehicle while getting across using a zebra-crossing, 7% during other crossing and 13% during other or unspecified walking in the road (Table 6).

Pedestrians are usually hit by cars (60%) (789 cases out of 1318, Table 7) especially when

- walking along the road (69%, data not shown)
- crossing a zebra-crossing (and/or with green light: 69%, with red light: 63%, data not shown)
- walking on the pavement (67%, data not shown)

Pedestrians are hit by motorcycles (35%) (457 cases out of 1318, Table 7) more often when

- they walk between cars to get across a road (45%, data not shown)
- after wrongly estimating the traffic situation (40%, data not shown)
- during crossing of a road under other or unspecified conditions (39%, data not shown)

Injuries among pedestrians are more severe than other road users, as they have the highest percentage of hospitalizations (32%), of deceased persons (3.3%) and the median length of stay in the hospital is the highest (5 days). For 43 pedestrians the outcome was death (Table 4). The most vulnerable age group is the elderly over 85 years old since almost half of them had to be hospitalized and 5% of them deceased (data not shown).

Almost half of the deaths occurred because the pedestrian crossed the road without checking. Other causes which have high proportions of deaths are crossing a zebra-crossing with red light and other crossing of a road. Crossing the road without checking, crossing a zebra-crossing and/or with green light and also waiting in the middle of the road to get across have the highest percentages of hospitalizations (33-35%) (Table 6).

Although most of the deaths were caused by cars and motorcycles (28 and 8 respectively), it is heavy vehicles (buses, trucks) which caused proportionally more deaths (6) and also hospitalizations (14% and 42% respectively) (Table 7).

Looking at the type of injury, 31% of the cases suffered only minor injuries but 30% had fractures and 22% concussions. Fractures were more common among pedestrians hit by cars and heavy vehicles whereas open wounds were more frequent among those hit by motorcycles (Table 8). In most of the cases the injury was located in the lower limbs (36%) and the head (34%). The proportion of injuries to the lower limbs was higher among pedestrians who were hit by cars (39%) whereas the proportion of injuries to the head was higher among pedestrians who were hit by heavy vehicles and motorcycles (51% and 39% respectively) (Table 9).

Almost half of the injuries occurred during 6am and 12pm. However, injuries appear to be more severe during the early morning hours (6am-9am) and during the evening and night hours (9pm-6am) which may be related to the low lighting conditions (data not shown).

Drivers

During the years 1996-2003 a total of 1310 elderly drivers were recorded in EDISS (185 bicycles, 679 motorcycles, 406 cars, and 40 other or unspecified vehicles). Males outnumber females by a factor of 17.2 especially concerning bicycle and motorcycles (97% males). Among cars, the percentage of female drivers reached 12% (data not shown). Concerning age, the vast majority was drivers 65-74 years old (75%) and only 1.5% were over 85 years old (Table 10).

In 38% of the cases the accident was the driver's fault (42% for cars, 38% for motorcycles and 28% for bicycles), in 52% the accident was not the driver's fault (59% for bicycles, 51% for motorcycles and cars) whereas for 10% it was unclear whose fault it was (Table 11).

The most common reason among the accidents which happened as a result of the driver's fault was carelessness (14% of all injuries). Conditions concerning speed and distance from other vehicles accounted for 8% of the total injuries whereas sleepiness or health problems and drunk driving accounted for 3% and 2% respectively. Not stopping at stop signs or lights or not yielding was

responsible for 7% of the injuries among drivers. Finally, another 4% of the accidents were due to change or entrance to the opposite lane (Table 11).

Among the accidents which did not happen as a result of the driver's fault, the most common reason was a collision with another vehicle (30% of all injuries) usually a car. The surface condition of the road was responsible for 11% of the cases but for motorcycles it reached 16%. For bicycle drivers, collision with other vehicle's door was the reason in 8% of the cases. Maneuver to avoid collision and mechanical failure accounted for 7% and 2% respectively (Table 11).

For 20 drivers (1.5%) the outcome was death. Bicycles and heavy vehicles, although they have the fewest cases, they had the highest percentage of deaths (2.2% and 4% respectively) whereas among motorcycles and cars the percentages of deaths were 1.3% and 1.5% respectively (Table 12, data for heavy vehicles not shown). When comparing the deceased drivers with the other injured drivers, no differences were observed concerning age and gender. Despite that the information concerning the possible responsibility of the driver for the accident in relation to the unfavorable outcome is limited from the recorded information 4 out of 10 deaths were due to the driver's fault (data not shown).

The overall percentage of hospitalizations was 29% and there were no substantial differences between the different types of vehicles (Table 12).

Concussions are more common among car and bicycle drivers (37% and 33%). Open wounds are more frequent among motorcycle drivers (19%). Fractures are more common among bicycle and motorcycle drivers (19-21%) (Table 13).

Among all drivers the head is the most often injured body part especially among car drivers (50%). Car drivers are also very often injured to the trunk (32%) and motorcycle drivers to the lower limbs (28%) (Table 14).

Among motorcycle drivers, only 18% had a helmet on at the time of the accident. However, the percentage is higher for the recent years and reaches 46% for 2003. Also, about 31% did not have a driving license (data not shown).

Among car drivers, 35% had their seatbelt fastened at the time of the accident. However, for 2003, the respective proportion for car drivers was significantly higher (53%) (data not shown).

The increase in helmet and seatbelt use during the recent years may be attributed to stricter regulations and more frequent police inspections.

About one in three injuries took place during 9am and 12pm (data not shown).

Passengers

During the years 1996-2003 a total of 564 elderly passengers were recorded in EDISS (72 motorcycles, 356 cars, and 136 other or unspecified vehicles i.e. mostly buses). Females outnumber males by a factor of 2.3 especially concerning cars (72% females) (Table 3). Concerning age, the vast majority was passengers of 65-74 years old (75%) and only 2% were over 85 years old (Table 15).

In 47% the accident was the vehicle's driver fault (36% for motorcycles, 44% for cars, and 63% for other vehicles), in 45% of the cases the accident was not the driver's fault (53% for motorcycles, 50% for cars, and 27% for other vehicles), whereas for 8% it was unclear whose fault it was (Table 16).

The most common reason among the accidents which happened as a result of the driver's fault was carelessness (15% of all injuries). Conditions concerning speed and distance from other vehicles accounted for 20% of the total injuries particularly among buses whereas sleepiness or health problems accounted for 2%. Not stopping at stop signs or lights or not yielding was responsible for 6% of the injuries. Finally, another 4% of the accidents were due to change or entrance to the opposite lane (Table 16).

Among the accidents which did not happen as a result of the driver's fault, the most common reason was a collision with another vehicle (32%) usually a car. The surface condition of the road was responsible for 4% of the cases but for motorcycles it reached 18%. Maneuver to avoid collision and mechanical failure accounted for 6% and 3% respectively (Table 16).

The overall percentage of hospitalizations was 27% but for passengers of buses it was lower (18%) (Table 17).

Concussions are more common among car passengers (29%). Open wounds are more frequent among motorcycle passengers (15%). Fractures are more common among car and bus passengers (17%) (Table 18).

Among all passengers the head is the most often injured body part especially among car passengers (42%). Car passengers are also very often injured to the trunk (31%) and motorcycle passengers to the lower limbs (35%) (Table 19).

Among motorcycle passengers, only 3% had a helmet on at the time of the accident (data not shown).

Among car drivers, 23% had their seatbelt fastened at the time of the accident (data not shown).

For 3 female passengers (0.5%) the outcome was death. For motorcycles the percentage of deaths was 1.4% and for cars 0.6%. There were no deaths recorded among other vehicles (Table 17).

About half of the injuries took place during 9am and 3pm (data not shown).

Unspecified road users

For the remaining 165 unspecified road users there was limited information. The age and gender distributions were similar to the whole data set. More specifically there were 113 males recorded (68%) and 52 females (32%). Also, 113 (68%) were under 70 years old and only 11 (7%) over 84 years old. In 4 of the cases the outcome was death (2.4%). Of these, 3 were males (2.7%) with injuries to the brain and 1 was female (1.9%) with multiple fractures (data not shown).

Tables for all road users

Table 1: Distribution of the 3357 road traffic injuries among elderly (65+) recorded in Greece by EDISS during 1996-2003, by type of road user and age group

Type of road user	Age								Total	
	65-69		70-74		75-84		85+			
	N	col %	N	col %	N	col %	N	col %	N	col %
Pedestrian	335	28.2	389	36.9	477	49.7	117	74.0	1318	39.3
Driver	552	46.5	427	40.6	312	32.5	19	12.0	1310	39.0
Passenger	240	20.2	184	17.5	129	13.5	11	7.0	564	16.8
Unspecified	60	5.1	53	5.0	41	4.3	11	7.0	165	4.9
Total	1187	100.0	1053	100.0	959	100.0	158	100.0	3357	100.0

Table 2: Distribution of the 3357 road traffic injuries among elderly (65+) recorded in Greece by EDISS during 1996-2003, by road user's vehicle and age group

Vehicle	Age								Total	
	65-69		70-74		75-84		85+			
	N	col %	N	col %	N	col %	N	col %	N	col %
Pedestrian	335	28.2	389	36.9	477	49.7	117	74.0	1318	39.2
Bicycle	51	4.3	51	4.8	77	8.0	6	3.8	185	5.5
Motorcycle	346	29.1	243	23.1	156	16.3	6	3.8	751	22.4
Car	339	28.6	250	23.7	158	16.5	15	9.5	762	22.7
Other or unspecified	116	9.8	120	11.4	91	9.5	14	8.9	341	10.2
Total	1187	100.0	1053	100.0	959	100.0	158	100.0	3357	100.0

Table 3: Distribution of the 3357 road traffic injuries among elderly (65+) recorded in Greece by EDISS during 1996-2003, by type of road user, vehicle and gender

Type of road user and vehicle	Gender				Total	
	Male		Female			
	N	col %	N	col %	N	col %
Pedestrian	640	29.6	678	56.8	1318	39.3
Bicycle	180	8.3	5	0.4	185	5.5
Motorbike driver	659	30.5	20	1.7	679	20.2
Motorbike passenger	26	1.2	46	3.8	72	2.1
Car driver	359	16.6	47	3.9	406	12.1
Car passenger	100	4.6	256	21.4	356	10.6
Other or unspecified	198	9.2	143	12.0	341	10.2
Total	2162	100.0	1195	100.0	3357	100.0

Table 4: Distribution of the 3357 road traffic injuries among elderly (65+) recorded in Greece by EDISS during 1996-2003, by outcome and type of vehicle. Median length of stay in hospital by type of vehicle also included.

Outcome	Type of vehicle										Total	
	Pedestrian		Bicycle		Motorbike		Car		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %	N	col %	N	col %
Examined	62	4.7	18	9.7	43	5.7	63	8.3	34	10.0	220	6.6
Treated	274	20.8	66	35.6	240	32.0	225	29.5	138	40.5	943	28.1
Treated & followed up	521	39.5	41	22.2	256	34.1	232	30.4	114	33.3	1164	34.6
Hospitalized	418	31.7	56	30.3	202	26.9	234	30.8	50	14.7	960	28.6
Deceased	43	3.3	4	2.2	10	1.3	8	1.0	5	1.5	70	2.1
Total	1318	100.0	185	100.0	751	100.0	762	100.0	341	100.0	3357	100.0
Median length of stay	5 days		3 days		2 days		2 days		4 days		3 days	

Tables for pedestrians

Table 5: Distribution of the 1318 road traffic injuries among elderly (65+) pedestrians recorded in Greece by EDISS during 1996-2003, by gender and age group

Gender	Age								Total	
	65-69		70-74		75-84		85+			
	N	col %	N	col %	N	col %	N	col %	N	col %
Male	166	49.6	147	37.8	247	51.8	80	68.4	640	48.6
Female	169	50.4	242	62.2	230	48.2	37	31.6	678	51.4
Total	335	100.0	389	100.0	477	100.0	117	100.0	1318	100.0

Table 6: Distribution of the 1318 road traffic injuries among elderly (65+) pedestrians recorded in Greece by EDISS during 1996-2003, by outcome and mechanism of injury

Mechanism	Outcome										Total		
	Examined		Treated		Outcome Treated & followed up		Hospitalized		Deceased				
	N	row %	N	row %	N	row %	N	row %	N	row %	N	row %	col %
Walking on the pavement	0	0.0	7	16.7	25	59.5	10	23.8	0	0.0	42	100.0	3.2
Crossing a zebra-crossing and/or with green light	1	2.0	8	15.7	24	47.1	17	33.3	1	2.0	51	100.0	3.9
Crossing a zebra-crossing with red light	0	0.0	4	14.8	15	55.6	6	22.2	2	7.4	27	100.0	2.0
Standing in the middle of the road	1	5.9	3	17.6	7	41.2	6	35.3	0	0.0	17	100.0	1.3
Walking between cars	1	3.4	5	17.2	14	48.4	9	31.0	0	0.0	29	100.0	2.2
Absent-minded, without checking	15	3.6	59	14.0	181	42.9	147	34.8	20	4.7	422	100.0	32.1
Wrong estimation	18	7.0	58	22.8	91	35.5	82	32.0	7	2.7	256	100.0	19.4
Other or unspecified crossing	6	6.5	24	26.2	29	31.5	29	31.5	4	4.3	92	100.0	7.0
Walking along/standing in the road	10	5.8	42	24.3	81	46.8	40	23.1	0	0.0	173	100.0	13.1
Getting off/on/in vehicle	0	0.0	11	34.4	13	40.6	8	25.0	0	0.0	32	100.0	2.4
Other or unspecified walking in the road	10	5.6	53	29.9	41	23.2	64	36.2	9	5.1	177	100.0	13.4
Total	62	4.7	274	20.8	521	39.5	418	31.7	43	3.3	1318	100.0	100.0

Table 7: Distribution of the 1318 road traffic injuries among elderly (65+) pedestrians recorded in Greece by EDISS during 1996-2003, by outcome and vehicle involved in the injury

Outcome	Vehicle involved								Total	
	Motorbike		Car		Heavy vehicle		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %	N	col %
Examined	24	5.3	34	4.3	1	2.3	3	10.4	62	4.7
Treated	104	22.8	150	19.0	7	16.3	13	44.8	274	20.8
Treated & followed up	164	35.8	337	42.8	11	25.6	9	31.0	521	39.5
Hospitalized	157	34.3	240	30.4	18	41.8	3	10.4	418	31.7
Deceased	8	1.8	28	3.5	6	14.0	1	3.4	43	3.3
Total	457	100.0	789	100.0	43	100.0	29	100.0	1318	100.0

Table 8: Distribution of the 1318 road traffic injuries among elderly (65+) pedestrians recorded in Greece by EDISS during 1996-2003, by type of injury and vehicle involved

Type of injury	Vehicle involved								Total	
	Motorbike		Car		Heavy vehicle		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %	N	col %
Concussion	104	22.8	159	20.2	16	37.2	5	17.2	284	21.5
Contusion, bruise, abrasion	144	31.5	247	31.3	5	11.6	15	51.7	411	31.2
Open wound	62	13.6	60	7.6	4	9.3	2	6.9	128	9.7
Fracture	118	25.8	262	33.2	13	30.2	7	24.1	400	30.3
Dislocation, distorsion	11	2.4	36	4.6	2	4.7	0	0.0	49	3.7
Other or unspecified	18	3.9	25	3.2	3	7.0	0	0.0	46	3.5
Total	457	100.0	789	100.0	43	100.0	29	100.0	1318	100.0

Table 9: Distribution of the 1318 road traffic injuries among elderly (65+) pedestrians recorded in Greece by EDISS during 1996-2003, by body part injured and vehicle involved

Part of body	Vehicle involved								Total	
	Motorbike		Car		Heavy vehicle		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %	N	col %
<i>Head</i>	178	39.0	239	30.3	22	51.1	7	24.2	446	33.9
Brain, skull	150	32.9	205	26.0	19	44.1	6	20.8	380	28.9
Head other	28	6.1	34	4.3	3	7.0	1	3.4	66	5.0
<i>Trunk</i>	55	12.0	116	14.6	2	4.7	3	10.3	176	13.4
<i>Upper limbs</i>	81	17.7	123	15.7	5	11.7	12	41.5	221	16.7
Shoulder, upper arm	27	5.9	51	6.5	2	4.7	4	13.9	84	6.4
Elbow, forearm	44	9.6	58	7.4	3	7.0	5	17.3	110	8.3
Wrist, hand	10	2.2	14	1.8	0	0.0	3	10.3	27	2.0
<i>Lower limbs</i>	143	31.3	311	39.4	14	32.5	7	24.0	475	36.0
Hip, upper leg	40	8.8	91	11.5	5	11.5	3	10.3	139	10.5
Knee, lower leg	76	16.6	122	15.5	3	7.0	3	10.3	204	15.5
Ankle, foot	27	5.9	98	12.4	6	14.0	1	3.4	132	10.0
Total	457	100.0	789	100.0	43	100.0	29	100.0	1318	100.0

Tables for drivers

Table 10: Distribution of the 1310 road traffic injuries among elderly (65+) drivers recorded in Greece by EDISS during 1996-2003, by age group and vehicle

Vehicle	Age group								Total	
	65-69		70-74		75-84		85+			
	N	row %	N	row %	N	row %	N	row %	N	row %
Bicycle	51	27.6	51	27.6	77	41.6	6	3.2	185	100.0
Motorcycle	309	45.5	225	33.1	139	20.5	6	0.9	679	100.0
Car	181	44.6	134	33.0	84	20.7	7	1.7	406	100.0
Other or unspecified	11	27.5	17	42.5	12	30.0	0	0.0	40	100.0
Total	552	42.1	427	32.6	312	23.8	19	1.5	1310	100.0

Table 11: Distribution of the 1310 road traffic injuries among elderly (65+) drivers recorded in Greece by EDISS during 1996-2003, by cause of injury and type of vehicle

Cause of injury	Driver's vehicle								Total	
	Bicycle		Motorbike		Car		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %	N	col %
<i>Not driver's fault</i>	110	59.5	349	51.4	206	50.7	14	35.0	679	51.9
Hit by other vehicle	74	40.0	161	23.7	144	35.5	8	20.0	387	29.5
Crushed into other vehicle's door	15	8.1	7	1.0	0	0.0	0	0.0	22	1.7
Potholes, grease, water	5	2.7	109	16.1	28	6.8	3	7.5	145	11.1
Maneuver to avoid collision	12	6.5	59	8.7	22	5.4	1	2.5	94	7.2
Mechanical failure	4	2.2	13	1.9	12	3.0	2	5.0	31	2.4
<i>Driver's fault</i>	52	28.1	258	38.0	172	42.4	20	50.0	502	38.3
Carelessness	21	11.4	107	15.8	50	12.2	9	22.5	187	14.3
Drunk driving	1	0.5	20	2.9	8	2.0	0	0.0	29	2.2
Speeding	0	0.0	5	0.7	6	1.5	3	7.5	14	1.1
Failure to stop at stop sign/light or to yield	11	5.9	36	5.3	38	9.4	4	10.0	89	6.8
Breaking	0	0.0	39	5.7	10	2.5	1	2.5	50	3.8
Following too closely	7	3.8	15	2.2	19	4.7	0	0.0	41	3.1
Passing, lane change	2	1.1	4	0.6	6	1.5	0	0.0	12	0.9
Entrance to the opposite lane	9	4.9	18	2.7	14	3.4	1	2.5	42	3.2
Sleepiness or health problem	1	0.5	14	2.1	21	5.2	2	5.0	38	2.9
<i>Other or unspecified</i>	23	12.4	72	10.6	28	6.9	6	15.0	129	9.8
Total	185	100.0	679	100.0	406	100	40	100	1310	100.0

Table 12: Distribution of the 1310 road traffic injuries among elderly (65+) drivers recorded in Greece by EDISS during 1996-2003, by outcome and driver's vehicle

Outcome	Driver's vehicle								Total	
	Bicycle		Motorbike		Car		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %	N	col %
Examined	18	9.7	37	5.4	36	8.9	5	12.5	96	7.3
Treated	66	35.6	223	32.8	114	28.1	10	25.0	413	31.5
Treated & followed up	41	22.2	228	33.7	126	31.0	10	25.0	405	30.9
Hospitalized	56	30.3	182	26.8	124	30.5	14	35.0	376	28.8
Deceased	4	2.2	9	1.3	6	1.5	1	2.5	20	1.5
Total	185	100.0	679	100.0	406	100.0	40	100.0	1310	100.0

Table 13: Distribution of the 1310 road traffic injuries among elderly (65+) drivers recorded in Greece by EDISS during 1996-2003, by type of injury and driver's vehicle

Type of injury	Driver's vehicle								Total	
	Bicycle		Motorbike		Car		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %	N	col %
Concussion	61	33.0	137	20.1	150	36.9	11	27.5	359	27.4
Contusion, bruise, abrasion	53	28.6	231	34.0	157	38.7	14	35.0	455	34.8
Open wound	24	13.0	129	19.0	46	11.3	6	15.0	205	15.6
Fracture	38	20.5	128	18.9	37	9.1	6	15.0	209	16.0
Dislocation, distorsion	5	2.7	38	5.6	6	1.5	0	0.0	49	3.7
Other or unspecified	4	2.2	16	2.4	10	2.5	3	7.5	33	2.5
Total	185	100.0	679	100.0	406	100.0	40	100.0	1310	100.0

Table 14: Distribution of the 1310 road traffic injuries among elderly (65+) drivers recorded in Greece by EDISS during 1996-2003, by part of body injured and driver's vehicle

Part of body	Driver's vehicle								Total	
	Bicycle		Motorbike		Car		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %	N	col %
<i>Head</i>	79	42.7	259	38.2	203	50.0	18	45.0	559	42.7
Brain, skull	70	37.8	194	28.6	176	43.3	16	40.0	456	34.8
Head other	9	4.9	65	9.6	27	6.7	2	5.0	103	7.9
<i>Trunk</i>	23	12.4	96	14.1	131	32.3	12	30.0	262	20.0
<i>Upper limbs</i>	36	19.4	135	19.9	32	7.9	6	15.0	209	15.9
Shoulder, upper arm	13	7.0	61	9.0	18	4.4	1	2.5	93	7.1
Elbow, forearm	10	5.4	30	4.4	6	1.5	4	10.0	50	3.8
Wrist, hand	13	7.0	44	6.5	8	2.0	1	2.5	66	5.0
<i>Lower limbs</i>	47	25.5	189	27.8	40	9.8	4	10.0	280	21.4
Hip, upper leg	19	10.3	20	2.9	9	2.2	3	7.5	51	3.9
Knee, lower leg	21	11.4	101	14.9	22	5.4	1	2.5	145	11.1
Ankle, foot	7	3.8	68	10.0	9	2.2	0	0.0	84	6.4
Total	185	100.0	679	100.0	406	100.0	40	100.0	1310	100.0

Tables for passengers

Table 15: Distribution of the 564 road traffic injuries among elderly (65+) passengers recorded in Greece by EDISS during 1996-2003, by age group and passenger's vehicle

Passenger's vehicle	Age								Total	
	65-69		70-74		75-84		85+			
	N	row %	N	row %	N	row %	N	row %	N	row %
Motorcycle	37	51.4	18	25.0	17	23.6	0	0.0	72	100.0
Car	158	44.4	116	32.6	74	20.8	8	2.2	356	100.0
Other or unspecified	45	33.1	50	36.8	38	27.9	3	2.2	136	100.0
Total	240	42.6	184	32.6	129	22.8	11	2.0	564	100.0

Table 16: Distribution of the 564 road traffic injuries among elderly (65+) passengers recorded in Greece by EDISS during 1996-2003, by cause of injury and passenger's vehicle

Cause of injury	Passenger's vehicle						Total	
	Motorbike		Car		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %
<i>Not driver's fault</i>	38	52.8	179	50.3	36	26.5	253	44.9
Hit by other vehicle	16	22.2	139	39.0	23	16.8	178	31.6
Potholes, grease, water	13	18.1	11	3.1	0	0.0	24	4.3
Maneuver to avoid collision	5	6.9	18	5.1	12	8.8	35	6.2
Mechanical failure	4	5.6	11	3.1	1	0.7	16	2.8
<i>Driver's fault</i>	26	36.1	155	43.5	85	62.5	266	47.1
Carelessness	12	16.6	49	13.7	22	16.3	83	14.6
Drunk driving	0	0.0	2	0.6	0	0.0	2	0.4
Speeding	0	0.0	10	2.8	1	0.7	11	2.0
Failure to stop at stop sign/ light or to yield	4	5.6	29	8.1	0	0.0	33	5.9
Breaking	6	8.3	19	5.3	58	42.8	83	14.6
Following too closely	0	0.0	20	5.6	1	0.7	21	3.7
Passing, lane change	1	1.4	2	0.6	2	1.5	5	0.9
Entrance to the opposite lane	2	2.8	12	3.4	1	0.7	15	2.7
Sleepiness or health problem	1	1.4	12	3.4	0	0.0	13	2.3
<i>Other or unspecified</i>	8	11.1	22	6.2	15	11.0	45	8.0
Total	72	100.0	356	100.0	136	100.0	564	100.0

Table 17: Distribution of the 564 road traffic injuries among elderly (65+) passengers recorded in Greece by EDISS during 1996-2003, by outcome and passenger's vehicle

Outcome	Passenger's vehicle						Total	
	Motorbike		Car		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %
Examined	6	8.3	27	7.6	11	8.1	44	7.8
Treated	17	23.6	111	31.1	36	26.5	164	29.1
Treated & followed up	28	38.9	106	29.8	64	47.0	198	35.1
Hospitalized	20	27.8	110	30.9	25	18.4	155	27.5
Deceased	1	1.4	2	0.6	0	0.0	3	0.5
Total	72	100.0	356	100.0	136	100.0	564	100.0

Table 18: Distribution of the 564 road traffic injuries among elderly (65+) passengers recorded in Greece by EDISS during 1996-2003, by type of injury and passenger's vehicle

Type of injury	Passenger's vehicle						Total	
	Motorbike		Car		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %
Concussion	13	18.1	101	28.4	20	14.7	134	23.8
Contusion, bruise, abrasion	28	38.8	144	40.4	72	52.9	244	43.2
Open wound	11	15.3	37	10.4	11	8.1	59	10.5
Fracture	10	13.9	58	16.3	28	20.6	96	17.0
Dislocation, distorsion	4	5.6	9	2.5	3	2.2	16	2.8
Other or unspecified	6	8.3	7	2.0	2	1.5	15	2.7
Total	72	100.0	356	100.0	136	100.0	564	100.0

Table 19: Distribution of the 564 road traffic injuries among elderly (65+) passengers recorded in Greece by EDISS during 1996-2003, by part of body injured and passenger's vehicle

Part of body	Passenger's vehicle						Total	
	Motorbike		Car		Other/Unspec.			
	N	col %	N	col %	N	col %	N	col %
<i>Head</i>	27	37.6	148	41.5	35	25.8	210	37.2
Brain, skull	20	27.9	123	34.5	29	21.4	172	30.5
Head other	7	9.7	25	7.0	6	4.4	38	6.7
<i>Trunk</i>	6	8.3	112	31.5	49	36.0	167	29.6
<i>Upper limbs</i>	14	19.4	51	14.3	23	16.9	88	15.6
Shoulder, upper arm	7	9.7	33	9.2	9	6.6	49	8.7
Elbow, forearm	6	8.3	11	3.1	9	6.6	26	4.6
Wrist, hand	1	1.4	7	2.0	5	3.7	13	2.3
<i>Lower limbs</i>	25	34.7	45	12.7	29	21.3	99	17.6
Hip, upper leg	4	5.6	11	3.1	15	11.0	30	5.3
Knee, lower leg	14	19.4	27	7.6	9	6.6	50	8.9
Ankle, foot	7	9.7	7	2.0	5	3.7	19	3.4
Total	72	100.0	356	100.0	136	100.0	564	100.0

Burn injuries due to fire, flames and contact with hot objects among elderly in Greece

During the eight year period 1996-2003, a total of 320 burn injuries due to fire, flames and contact with hot object among elderly were recorded by EDISS accounting for 0.9% of the total home and leisure injuries among elderly.

Demographic characteristics

The majority of burn injuries due to fire, flames or contact with hot object concerned females (63%) except in the age group 85+ in which males account for 62% (Table 1).

Event characteristics

Home inside is the most common place for a burn injury to occur (83%) especially the kitchen (72%). However, it is females who are more frequently injured in the kitchen (72% vs 39%) whereas males are injured more frequently than females in other places inside or around home but also in areas other than home (Table 2). Elderly people over 84 years old were almost exclusively burned inside home (Table 3).

Overall, these injuries occur mostly during leisure activities (38%), cooking (29%) and other domestic work (13%). Other activities include cleaning (5%), do-it-yourself work (4%) and vital activity (7%). However, females are burned more often than males during domestic work such as cooking (40%), cleaning (6%) or other domestic work (13%) whereas males are more often burned during leisure activities (56%), do-it-yourself work (9%) and vital activities (8%). (Table 4) Leisure and vital activities are also more common among elderly over 84 years old (62% and 10% respectively) whereas the proportion of cooking decreases as the age progresses (Table 5).

The most common object for causing burns was hot water (33%) while for 21% of the cases the burn was caused by out of control flames or explosion, mostly among males (29% vs. 17%). Flames or explosions were caused by flammable liquids (8%), camping gas or gas canisters (7%) or other products (7%). The high proportion of burns due to camping gas reflects the fact that the use of this product is very common in Greek households. Other objects that caused burns after contact especially among women are cooking oils (14%), drink, food or steam (12%), heating apparatus (6%), cooker, oven and cooking utensils (5%) while for burns due to motorcycle exhaust pipes (3%) the proportion was higher among males (Table 6). With respect to age the proportion of flames and explosions raises to 38% among 85+ and to 14% regarding heating apparatus (Table 7).

The percentage of burns which occurred during autumn and winter was 56%. Almost half of the injuries occurred during 10am and 4pm. There was also an increased risk of burns noticed during the weekends (35%) especially for women (41% vs. 25%). (data not shown)

Injury characteristics

Most of the burns were located in the upper limbs (43%) especially wrist, hand or fingers (29%) and the forearm (10%) which was more common among females (13% vs. 6%). Lower limbs accounted for 33% and concerned mostly the ankle, foot or toes (15%) and the lower leg (12%) which was more common among males (16% vs. 10%). About 13% of the burns were located on the trunk and 11% on the head (Table 8). As the age progresses the proportion of burns to the lower limb increases to 57% for ages 85+ while the proportion of burns to the upper limb decreases (Table 9).

Most of the elderly were examined or treated (47%) while for 40% follow up was necessary. The proportion of hospitalized elderly persons was 11% with median length of stay 3 days but these numbers were higher among elderly of ages 85+ years (19% and 6 days respectively) (Table 10). Out of control flames or explosion of flammable liquids and camping gas were responsible for the most severe burns since the respective proportions of hospitalization were the highest (46% and 26% respectively) followed by heating apparatus (21%). There were 3 deaths recorded (1%): two females (one due to camping gas explosion and one due to contact with fireplace) and one male with unknown product causing the burn (Tables 11 & 12).

Tables

Table 1: Distribution of the 320 burn injuries among elderly (65+), recorded by EDISS during 1996-2003, by age group and gender

Gender	Age						Total	
	65-74		75-84		85 +			
	N	col %	N	col %	N	col %	N	col %
Male	84	38.4	21	26.3	13	61.9	118	36.9
Female	135	61.6	59	73.7	8	38.1	202	63.1
Total	219	100.0	80	100.0	21	100.0	320	100.0

Table 2: Distribution of the 320 burn injuries among elderly (65+), recorded by EDISS during 1996-2003, by place and gender

Place	Gender				Total	
	Male		Female			
	N	col %	N	col %	N	col %
Kitchen	46	39.0	146	72.2	192	60.0
Inside home, other	35	29.7	37	18.3	72	22.5
Around the house	15	12.7	7	3.5	22	6.9
Other	17	14.4	5	2.5	22	6.9
Unspecified	5	4.2	7	3.5	12	3.7
Total	118	100.0	202	100.0	320	100.0

Table 3: Distribution of the 320 burn injuries among elderly (65+), recorded by EDISS during 1996-2003, by place and age group

Place	Age						Total	
	65-74		75-84		85+			
	N	col %	N	col %	N	col %	N	col %
Kitchen	129	58.9	53	66.2	10	47.6	192	60.0
Inside home, other	48	21.9	14	17.5	10	47.6	72	22.5
Around the house	14	6.4	8	10.0	0	0.0	22	6.9
Other	18	8.2	3	3.8	1	4.8	22	6.9
Unspecified	10	4.6	2	2.5	0	0.0	12	3.7
Total	219	100.0	80	100.0	21	100.0	320	100.0

Table 4: Distribution of the 320 burn injuries among elderly (65+), recorded by EDISS during 1996-2003, by activity and gender

Activity	Gender				Total	
	Male		Female			
	N	col %	N	col %	N	col %
Cooking	12	10.2	81	40.1	93	29.1
Cleaning	6	5.1	11	5.5	17	5.3
Domestic work other	9	7.6	33	16.3	42	13.1
Do-it-yourself work	11	9.3	1	0.5	12	3.8
Leisure activity	66	56.0	57	28.2	123	38.4
Vital activity	9	7.6	13	6.4	22	6.9
Unspecified	5	4.2	6	3.0	11	3.4
Total	118	100.0	202	100.0	320	100.0

Table 5: Distribution of the 320 burn injuries among elderly (65+), recorded by EDISS during 1996-2003, by activity and age group

Activity	Age						Total	
	65-74		75-84		85+			
	N	col %	N	col %	N	col %	N	col %
Cooking	64	29.2	26	32.5	3	14.3	93	29.1
Cleaning	12	5.5	5	6.3	0	0.0	17	5.3
Domestic work other	29	13.2	10	12.5	3	14.3	42	13.1
Do-it-yourself work	10	4.6	2	2.5	0	0.0	12	3.8
Leisure activity	81	37.0	29	36.3	13	61.9	123	38.4
Vital activity	14	6.4	6	7.5	2	9.5	22	6.9
Unspecified	9	4.1	2	2.5	0	0.0	11	3.4
Total	219	100.0	80	100.0	21	100.0	320	100.0

Table 6: Distribution of the 320 burn injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by product causing the burn and gender

Product	Gender				Total	
	Male		Female			
	N	col %	N	col %	N	col %
Water	40	33.9	66	32.7	106	33.1
Cooking oil or butter	9	7.6	37	18.3	46	14.4
Other drink/food or steam	9	7.6	28	13.9	37	11.6
<i>Out of control flames or explosion</i>	34	28.8	34	16.8	68	21.3
Flammable liquids	13	11.0	11	5.4	24	7.5
Camping gas/gas canister	7	5.9	16	7.9	23	7.2
Other	14	11.9	7	3.5	21	6.6
Heating apparatus	3	2.6	16	7.9	19	5.9
Cooker, oven and cooking utensils	4	3.4	13	6.4	17	5.3
Motorcycle exhaust pipe	8	6.8	2	1.0	10	3.1
Other/ Unspec.	11	9.3	6	3.0	17	5.3
Total	118	100.0	202	100.0	320	100.0

Table 7: Distribution of the 320 burn injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by product causing the burn and age group

Product	Age						Total	
	65-74		75-84		85+			
	N	col %	N	col %	N	col %	N	col %
Water	70	32.0	31	38.7	5	23.7	106	33.1
Cooking oil or butter	34	15.5	9	11.2	3	14.3	46	14.4
Other drink/food or steam	28	12.8	8	10.0	1	4.8	37	11.6
<i>Out of control flames or explosion</i>	42	19.2	18	22.6	8	38.1	68	21.3
Flammable liquids	17	7.8	4	5.0	3	14.3	24	7.5
Camping gas/gas canister	12	5.5	7	8.8	4	19.0	23	7.2
Other	13	5.9	7	8.8	1	4.8	21	6.6
Heating apparatus	12	5.5	4	5.0	3	14.3	19	5.9
Cooker, oven and cooking utensils	12	5.5	4	5.0	1	4.8	17	5.3
Motorcycle exhaust pipe	8	3.6	2	2.5	0	0.0	10	3.1
Other/ Unspec.	13	5.9	4	5.0	0	0.0	17	5.3
Total	219	100.0	80	100.0	21	100.0	320	100.0

Table 8: Distribution of the 320 burn injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by part of body and gender

Part of body	Gender				Total	
	Male		Female.			
	N	col %	N	col %	N	col %
<i>Head</i>	12	10.2	23	11.4	35	10.9
<i>Trunk</i>	16	13.6	27	13.3	43	13.4
<i>Upper limb</i>	47	39.8	90	44.6	137	42.9
Forearm	7	5.9	26	12.9	33	10.3
Wrist, hand, fingers	36	30.5	56	27.7	92	28.8
Upper limb other	4	3.4	8	4.0	12	3.8
<i>Lower limb</i>	43	36.4	62	30.7	105	32.8
Lower leg	19	16.1	20	9.9	39	12.2
Ankle, foot, toe	20	16.9	29	14.4	49	15.3
Lower limb other	4	3.4	13	6.4	17	5.3
Total	118	100.0	202	100.0	320	100.0

Table 9: Distribution of the 320 burn injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by part of body and age group

Part of body	Age						Total	
	65-74		75-84		85+			
	N	col %	N	col %	N	col %	N	col %
<i>Head</i>	25	11.4	8	10.0	2	9.5	35	10.9
<i>Trunk</i>	30	13.7	11	13.7	2	9.5	43	13.4
<i>Upper limb</i>	99	45.2	33	41.3	5	23.9	137	42.9
Forearm	23	10.5	9	11.3	1	4.8	33	10.3
Wrist, hand, fingers	70	32.0	18	22.5	4	19.1	92	28.8
Upper limb other	6	2.7	6	7.5	0	0.0	12	3.8
<i>Lower limb</i>	65	29.7	28	35.0	12	57.1	105	32.8
Lower leg	26	11.9	8	10.0	5	23.8	39	12.2
Ankle, foot, toe	33	15.1	10	12.5	6	28.5	49	15.3
Lower limb other	6	2.7	10	12.5	1	4.8	17	5.3
Total	219	100.0	80	100.0	21	100.0	320	100.0

Table 10: Distribution of the 320 burn injuries among elderly (65+), recorded by EDISS during 1996-2003, by outcome and age group. Median length of stay in hospital by age group also included

Outcome	Age						Total	
	65-74		75-84		85 +		N	col %
	N	col %	N	col %	N	col %	N	col %
Examined or treated	112	51.1	30	37.5	9	42.9	151	47.2
Treated and followed up	85	38.8	38	47.5	7	33.3	130	40.6
Hospitalized	22	10.1	10	12.5	4	19.0	36	11.3
Deceased	0	0.0	2	2.5	1	4.8	3	0.9
Total	219	100.0	80	100.0	21	100.0	320	100.0
Median length of stay	4 days		2.5 days		6 days		3 days	

Table 11: Distribution of the 320 burn injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by outcome and product causing the burn (absolute numbers only)

Outcome	Product											Total N
	Water	Cooking oil or butter	Other drink/food or steam	Out of control flames or explosion	Camping gas/gas canister			Heating aparratus	Cooker, oven and cooking utensils	Motorcycle exhaust pipe	Other/ Unspec.	
					Flammable liquids	other	other					
N	N	N	N	N	N	N	N	N	N	N	N	
Examined or treated	49	29	20	24	7	7	10	4	10	6	9	151
Treated and followed up	48	16	15	23	6	9	8	10	7	4	7	130
Hospitalized	9	1	2	20	11	6	3	4	0	0	0	36
Deceased	0	0	0	1	0	1	0	1	0	0	1	3
Total	106	46	37	68	24	23	21	19	17	10	17	320

Table 12: Distribution of the 320 burn injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003, by outcome and product causing the burn (column percent only)

Outcome	Product											Total col %
	Water	Cooking oil or butter	Other drink/food or steam	Out of control flames or explosion	Camping gas/gas canister			Heating apparatus	Cooker, oven and cooking utensils	Motorcycle exhaust pipe	Other/ Unspec.	
					Flammable liquids	col %	Other					
col %	col %	col %	col %	col %	col %	col %	col %	col %	col %	col %		
Examined or treated	46.2	63.0	54.1	35.3	29.2	30.4	47.6	21.1	58.8	60.0	52.9	47.2
Treated and followed up	45.3	34.8	40.5	33.8	25.0	39.1	38.1	52.6	41.2	40.0	41.2	40.6
Hospitalized	8.5	2.2	5.4	29.4	45.8	26.1	14.3	21.0	0.0	0.0	0.0	11.3
Deceased	0.0	0.0	0.0	1.5	0.0	4.4	0.0	5.3	0.0	0.0	5.9	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Accidental poisonings among elderly in Greece (excluding contact with poisonous animals)

During the eight year period 1996-2003, a total of 22 accidental poisonings among elderly (65+) were recorded by EDISS accounting for 0.06% of the total home and leisure injuries among elderly. The small number of poisoning cases recorded can be attributed to the fact that adult poisoning cases are regularly treated in departments of Internal Medicine and thus are not captured by EDISS.

Brief analysis

The majority of accidental poisonings concerned females (59%) and ages 65-74 years (64%) (Table 1). These injuries took place mostly inside home (50%) (Table 2) and were caused by soap and detergents (36%), food (36%), pharmaceutical products (14%), white spirit (9%) and agricultural chemicals (5%). Almost half of them required hospitalization with 5.5 days median length of stay (data not shown) but the proportion was higher among poisonings from food (75%) and agricultural chemical (100%). No deaths were recorded (Table 3).

Tables

Table 1: Distribution of the 22 accidental poisonings among elderly (65+), recorded by EDISS during 1996-2003, by age group and gender

Gender	Age						Total	
	65-74		75-84		85 +			
	N	col %	N	col %	N	col %	N	col %
Male	8	57.1	1	14.3	0	0.0	9	40.9
Female	6	42.9	6	85.7	1	100.0	13	59.1
Total	14	100.0	7	100.0	1	100.0	22	100.0

Table 2: Distribution of the place of the 22 accidental poisonings among elderly (65+), recorded in Greece by EDISS during 1996-2003

Place	N	col %
Home inside	11	50.0
Other	9	40.9
Unspecified	2	9.1
Total	22	100.0

Table 3: Distribution of the 22 accidental poisonings among elderly (65+), recorded by EDISS during 1996-2003, by outcome and product causing the poisoning.

Outcome	Product										Total	
	Soap, detergent		Food		Pharmaceutical		White spirit		Agricultural chemical			
	N	col %	N	col %	N	col %	N	col %	N	col %	N	col %
Examined	2	25.0	1	12.5	2	66.7	0	0.0	0	0.0	5	22.7
Treated	5	62.5	1	12.5	0	0.0	1	50.0	0	0.0	7	31.8
Hospitalized	1	12.5	6	75.0	1	33.3	1	50.0	1	100.0	10	45.5
Total	8	100.0	8	100.0	3	100.0	2	100.0	1	100.0	22	100.0

Accidental drowning and near-drowning injuries among elderly in Greece

During the eight year period 1996-2003, a total of 38 accidental drowning or near drowning injuries among elderly (65+) were recorded by EDISS accounting for 0.1% of the total home and leisure injuries among elderly.

Brief analysis

The majority of drowning injuries concerned males (63%) and half of them concerned ages 65-74 years (Table 1). Nearly all cases occurred in the sea except for one case which occurred in a bathtub in an elderly home (Table 2). Most of them (53%) occurred during the summer (79%, Table 3) and during the hours 10a.m. to 1p.m. (53%, Table 4). The outcome was fatal for most of the elderly (53%) especially those over 74 years old (74%) while 40% had to be hospitalized for at least one day. It should be noted however, that the proportion of fatal injuries is underestimated as these injuries are usually not captured by EDISS.

Tables

Table 1: Distribution of the 38 drowning and near-drowning injuries among elderly (65+), recorded by EDISS during 1996-2003, by age group and gender

Gender	Age						Total	
	65-74		75-84		85 +		N	col %
Male	13	68.4	9	60.0	2	50.0	24	63.2
Female	6	31.6	6	40.0	2	50.0	14	36.8
Total	19	100.0	15	100.0	4	100.0	38	100.0

Table 2: Distribution of the place of the 38 drowning and near-drowning injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003

Place	N	col %
Elderly home (bathtub)	1	2.6
Sea	36	94.8
Unspecified	1	2.6
Total	38	100.0

Table 3: Distribution of the season of the 38 drowning and near-drowning injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003

Season	N	col %
June-August	30	79.0
September-May	8	21.0
Total	38	100.0

Table 4: Distribution of the time of the 38 drowning and near-drowning injuries among elderly (65+), recorded in Greece by EDISS during 1996-2003

Time	N	col %
07:00-09:59	7	18.4
10:00-12:59	20	52.7
13:00-15:59	4	10.5
16:00-18:59	4	10.5
Unspecified	3	7.9
Total	38	100.0

Table 5: Distribution of the 38 drowning and near-drowning injuries among elderly (65+), recorded by EDISS during 1996-2003, by outcome and age group. Median length of stay in hospital by age group is also included

Outcome	Age						Total	
	65-74		75-84		85 +		N	col %
	N	col %	N	col %	N	col %	N	col %
Examined or treated	2	10.5	1	6.7	0	0.0	3	7.9
Hospitalized	11	57.9	3	20.0	1	25.0	15	39.5
Deceased	6	31.6	11	73.3	3	75.0	20	52.6
Total	19	100.0	15	100.0	4	100.0	38	100.0
Median length of stay	2 days		2 days		not available		2 days	