

Recent Road Safety Data in the Netherlands

P. Wesemann & J.M.J. Bos

Met financiële bijdrage van:

VERBOND VAN VERZEKERAARS



Recent Road Safety Data in the Netherlands

Background Document for the fourth World Conference 'Injury prevention and control', Amsterdam, May 1998

Report documentation

Number: R-98-16E
Title: Recent Road Safety Data in the Netherlands
Subtitle: Background Document for the fourth World Conference 'Injury prevention and control', Amsterdam, May 1998
Author(s): P. Wesemann & J.M.J. Bos
Research manager: P. Wesemann
Project number SWOV: 70.146
Client: This report has been written by SWOV, and was made possible by a subsidy of the Netherlands Association of Insurers, Motor Vehicle Department.

Keywords: Cost, safety, fatality, injury, severity, accident, road user, age, man, woman, hospital, EEC, Netherlands.

Contents of the project: Within the framework of the Fourth World Conference 'Injury prevention and control' which is to be held in May 1998, there is a need for background documentation containing recent data on the various types of safety in the Netherlands (in sport, in the domestic sphere, in traffic, and at work). This report contains the SWOV contribution, with the relevant data concerning road safety.

Number of pages: 25 pp.
Price: Dfl. 17,50
Published by: SWOV, Leidschendam, 1998

SWOV Institute for Road Safety Research
P.O. Box 1090
2260 BB Leidschendam
The Netherlands
Telephone 31703209323
Telefax 31703201261

Contents

<i>Foreword</i>	4
1. <i>Introduction</i>	5
2. <i>The absolute size of the road safety problem</i>	6
3. <i>The absolute size of the road safety problem, 1986-1996</i>	9
4. <i>Mortality, 1980-1994</i>	12
5. <i>Death and injury rates per kilometre and per hour, 1994-1996</i>	14
5.1. <i>Death and injury rates per occupant kilometre and vehicle kilometre</i>	14
5.2. <i>Death and injury rates per hour travelled</i>	16
6. <i>Death and in-patient rates per vehicle-kilometre, 1986-1996</i>	17
7. <i>Years of Life Lost (YLL), 1990 en 1994</i>	19
8. <i>Costs of road accident injuries, 1993</i>	20
9. <i>International comparisons</i>	21
9.1. <i>Absolute size of the road safety in the EU, 1990-1994</i>	21
9.2. <i>Mortality in the EU, 1980-1994</i>	22
9.3. <i>Death rates per motorvehicle kilometres in the EU, 1980-1994</i>	23
9.4. <i>Costs of traffic injuries in the EU, 1990</i>	23
<i>Literature</i>	25

Foreword

In May 1998, the Fourth World Conference 'Injury prevention and control' takes place in Amsterdam. During this conference, ideas will be exchanged concerning the dangers of various social activities; sport, at home, in traffic, and at work. Besides injuries suffered as a result of an accident, attention will also be paid to injuries inflicted deliberately (violence and suicide). The Scientific Programme Committee that has prepared the contents, has let it be made known that there exists a need for background documentation with recent data concerning the above-mentioned types of dangers in The Netherlands. As far as they are directly available, this documentation should also contain some international data for comparison.

This report is SWOV's contribution; it contains that data chiefly concerning road safety.

Our contribution has been made possible thanks to the annual subsidy to SWOV from the Vehicle Insurance Department of the Netherlands Association of Insurers.

1. Introduction

A selection has been made of that data which can be considered indicative of the size and severity of road safety in the Netherlands at this moment in time and for the developments of this problem during (approximately) the last ten years. In choosing the subjects and the periods, the availability of comparable data for domestic, industrial, and sport accidents has been taken into account.

The following have been selected to show the size of road safety:

- the absolute numbers of victims, subdivided by severity (deaths, seriously injured, and slightly injured);
- the mortality: deaths per 100,000 population;
- the injury rates per kilometre or per hour;
- the number of Years of Life Lost (YLL);
- the costs of injuries.

For the comparison between member countries of the European Union (EU) practically all indicators were available.

For the comparison with other accidents outside traffic, data was available for the absolute numbers of deaths, the mortality, and the Years of Life Lost.

To describe the present day situation in the Netherlands, the period of 1994-1996 was chosen.

For some of the comparisons these three years were totalised. For example, this was done for the calculation of the injury rate per occupant-kilometre and per hour travelled, because for some of the subdivisions (age-group or modal split), the absolute numbers per annum were too small.

2. The absolute size of the road safety problem

In order to describe the present day situation, as far as the absolute numbers of traffic victims are concerned, the period 1994-1996 has been chosen.

These are official national estimates, based on three sources:

1. the police registration (deaths and in-patients);
2. the National Patient Register;
3. a special registration of accident victims who have been treated in the Accident & Emergency (A&E) departments of a sample of hospitals.

The period 1994-1996 has been chosen because the real numbers are only known for these three years.

For the years previous to 1994, the police data is the source for fatalities and in-patients.

The following numbers of victims apply to the Netherlands during the 1994-1996 period:

- an annual average of 1,271 deaths;
- an annual average of 19,477 seriously injured (in-patients);
- an annual average of 97,527 slightly injured (treated at hospital A&E's).

More detailed subdivisions are available for each victim severity (annual averages 1994-1996). In *Table 2.4* it appears that most of the deaths are occupants of cars and vans (52%), most of the seriously injured are cyclists (36%), and most of the slightly injured are (also) cyclists.

The comparison between the various age-groups is better if they are related to their sizes, or to their exposure (the extent that they travel); the latter will be discussed in chapter 5.

The comparison between the various modal splits is also better if they are related to their exposure; this is discussed in chapter 5.

Male					
Age group	1994	1995	1996	Total	Average
0-14	56	51	42	149	50
15-24	220	237	225	682	227
25-39	242	258	225	725	242
40-54	149	149	132	430	143
55-64	77	76	62	215	72
65-74	82	85	67	234	78
75+	102	95	85	282	94
Total	928	951	838	2717	906
Female					
Age group	1994	1995	1996	Total	Average
0-14	37	36	24	97	32
15-24	73	58	66	197	66
25-39	75	64	60	199	66
40-54	37	55	53	145	48
55-64	43	41	18	102	34
65-74	56	63	50	169	56
75+	49	66	71	186	62
Total	370	383	342	1095	365

Table 2.1. Real numbers of victims (deaths), by age-group and sex, 1994-1996.
Source: police registration.

Male					
Age group	1994	1995	1996	Total	Average
0-14	1511	1503	1420	4434	1478
15-24	3218	3289	3202	9709	3236
25-39	2873	2961	2953	8787	2929
40-54	1785	1869	1809	5463	1821
55-64	781	766	769	2316	772
65-74	791	741	754	2286	762
75+	685	732	695	2112	704
Total	11644	11861	11602	35107	11702
Female					
Age group	1994	1995	1996	Total	Average
0-14	1110	1187	1163	3460	1153
15-24	1562	1624	1463	4649	1550
25-39	1325	1330	1376	4031	1344
40-54	1063	1135	1109	3307	1102
55-64	815	808	798	2421	807
65-74	1093	1085	1014	3192	1064
75+	749	770	747	2266	755
Total	7717	7939	7670	23326	7775

Table 2.2. Real numbers of victims (in-patients), by age-group and sex, 1994-1996.
Source: SIG Health Care Information.

Male					
Age group	1994	1995	1996	Total	Average
0-14	12088	11718	10539	34345	11448
15-24	17582	17186	15434	50202	16734
25-39	14655	15784	14055	44494	14831
40-54	7217	7241	6696	21154	7051
55-64	2197	2657	2245	7099	2366
65-74	1689	1722	1270	4681	1560
75+	943	1082	741	2766	922
unknown	41	33	48	122	41
Total	56412	57423	51028	164863	54954
Female					
Age group	1994	1995	1996	Total	Average
0-14	9168	9798	9034	28000	9333
15-24	12071	12431	11037	35539	11846
25-39	8947	9634	8754	27335	9112
40-54	5666	5986	5433	17085	5695
55-64	2862	3149	2432	8443	2814
65-74	2804	2845	2362	8011	2670
75+	1238	1230	1115	3583	1194
unknown	41	33	48	122	41
Total	42797	45106	40215	128118	42706

Table 2.3. *Real numbers of victims (in-patients), by age-group and sex, 1994-1996. Source: sample of hospital Accident & Emergency departments.*

	Pedestrians	Cyclists	Mopedists	Motor-cyclists	Car & van	Lorry & bus	Rest	Total
Deaths	125	255	104	98	664	16	9	1271
In-patients	1630	7110	3043	1343	6393	130	110	19759
A&E patients	4083	49550	14767	4667	23467	383	683	97600

Table 2.4. *Real numbers of victims by modal split, 1994-1996 (average). Source: sample of hospital Accident & Emergency departments.*

3. The absolute size of the road safety problem, 1986-1996

During this period, the number of victims developed as follows:

Deaths:

- between 1986 and 1991 the number fell from 1.527 to 1.281, thus by 246 (16 %);
- between 1991 and 1995 this number stabilised around 1.300;
- in 1996 the number fell to 1.180.

In-patients:

- between 1986 and 1991 the number fell slightly from 20.660 to 18.304, thus by 2.356 (11 %);
- after this, this number stabilised at a slightly higher level, and in 1996, it was about 19.000.

In *Table 3.1.* the development between 1986 and 1996 is given of the number of deaths and in-patients subdivided by age-group; in *Table 3.2* by modal split.

In chapter 5 a comparison is made, during the period 1986-1996, between the modal splits in which the exposure is taken into account.

Year	Age group							
	0-14	15-24	25-39	40-54	55-64	65-74	75+	Total
Deaths								
1986	100	410	332	210	136	160	179	1527
1987	119	428	231	227	136	175	169	1485
1988	93	377	284	205	115	139	153	1366
1989	115	401	283	205	116	141	195	1456
1990	100	362	296	200	111	141	166	1376
1991	86	362	267	196	98	132	140	1281
1992	93	308	283	185	105	161	150	1285
1993	88	306	290	167	84	144	173	1252
1994	93	293	317	186	120	138	151	1298
1995	87	295	322	204	117	148	161	1334
1996	66	291	285	185	80	117	156	1180
In-patients								
	0-14	15-24	25-39	40-54	55-64	65-74	75+	Total
1986	3058	6929	3694	2541	1592	1637	1209	20660
1987	2849	6686	3647	2585	1560	1651	1157	20135
1988	2795	6541	3557	2424	1549	1618	1290	19774
1989	2798	6393	3631	2634	1711	1790	1320	20277
1990	2764	6185	3690	2615	1576	1754	1334	19918
1991	2561	5151	3674	2486	1431	1639	1362	18304
1992	2630	5268	3830	2645	1499	1647	1485	19004
1993	2633	4839	4020	2807	1539	1749	1406	18993
1994	2621	4780	4198	2848	1596	1884	1434	19361
1995	2690	4913	4291	3004	1574	1826	1502	19800
1996	2583	4665	4329	2918	1567	1768	1442	19272

Table 3.1. Trends 1986-1996. Sources: Police (deaths), SIG Health Care Information (in-patients).

Deaths									
Year	Pedestrian	Cyclist	Mopedist	Motorcycle	Car	Van	Lorry/bus	Rest	Total
1986	216	311	133	64	739	40	15	9	1527
1987	172	311	126	58	769	35	9	5	1485
1988	201	282	117	62	647	35	18	4	1366
1989	190	332	130	64	679	39	14	8	1456
1990	144	304	95	72	702	45	10	4	1376
1991	144	238	110	88	630	39	19	13	1281
1992	152	250	103	93	626	36	21	4	1285
1993	146	243	87	106	615	28	12	15	1252
1994	123	267	93	112	614	61	15	13	1298
1995	142	267	117	90	657	41	17	3	1334
1996	109	232	103	91	575	44	16	10	1180
In-patients									
Year	Pedestrian	Cyclist	Mopedist	Motorcycle	Car/Van	Lorry/bus	Rest	Total	
1986	2109	6251	3256	954	5217	182	2691	20660	
1987	2062	6089	2985	886	5221	208	2684	20135	
1988	2132	5897	3048	1021	4963	165	2548	19774	
1989	2055	6640	3047	999	4933	183	2420	20277	
1990	2002	6415	2978	956	5092	189	2286	19918	
1991	1826	6270	2319	1009	4671	147	2062	18304	
1992	1892	6531	2473	1155	4718	186	2049	19004	
1993	1822	6628	2278	1139	4886	242	1998	18993	
1994	1834	6880	2351	1193	4893	260	1950	19361	
1995	1703	7219	2549	1209	4850	261	2009	19800	
1996	1732	6914	2412	1234	4706	295	1979	19272	

Table 3.2. Absolute number of victims by modal split, trend 1986-1996. Source: police (deaths), SIG Health Care Information (in-patients).

4. Mortality, 1980-1994

Data concerning mortalities (deaths per 100,000 population) have been taken from a RIVM study, published in 1997.

The following unnatural causes of death have been extracted:

- a. suicide,
- b. accidental fall,
- c. road accidents,
- d. violence,
- e. accidental drowning,
- f. accidental poisoning.

As this comparison is primarily aimed at injury as a result of an accident, suicide and violence are omitted.

We are concerned here with a comparison of objective exposure to various social activities. Although in the case of accidents there are (by definition) no deliberate injuries, people are more aware of the dangers of some activities than of others.. It can be the extra danger of some activities that makes them attractive (compare mountaineering and fast driving with climbing up the stairs at home).

Cause of death	Absolute deaths 1994	Males per 100.000			Females per 100.000		
		1980	1990	1994	1980	1990	1994
Suicide and automutilation	1584	13.9	12.3	14.0	8.0	7.2	6.4
Violence	171	1.1	1.2	1.6	0.6	0.6	0.7
Accidents							
Road Accidents	1322	22.0	13.5	12.8	7.7	5.4	4.7
Accidental fall	1561	9.0	7.9	6.9	21.1	13.4	12.3
Accidental drowning	104	1.6	1.2	1.1	0.4	0.3	0.3
Accidental poisoning	60	1.3	0.6	0.5	0.5	0.1	0.3
Total	4802	48.9	36.7	36.9	38.3	27.0	24.7

Table 4.1. *Deaths by cause and sex, per 100.000 people; 1980, 1990, and 1994, standardised for the Netherlands population in 1990. Sources: RIVM study, 1997 and Statistics Netherlands; Statistics of the causes of death.*

In 1994 accidental falls were the greatest cause of death. The differences between males and females are large; even though there have been many changes during the course of time.

The mortality from accidental falls in 1994 was, under males, almost half of that under females (7.9 versus 12.3). With road accidents on the other hand, males have a mortality nearly three times higher than females (12.8 versus 4.7). This is also true of accidental drowning.

In 1994, the male mortality from road accidents was the highest, but for females this was accidental falls. The mortalities (as a result of the causes mentioned) for both were considerably higher in 1980.

5. Death and injury rates per kilometre and per hour, 1994-1996

Injury rates have been calculated for the period 1994-1996, by severity (deaths, in-patients, A&E patients).

For comparisons between age-group and sex, the three years have been totalised so that the absolute numbers are large enough. In the numerator are the numbers of victims, and in the denominator the data from the National Travel Survey (NTS) of Statistics Netherlands. The NTS data refer to the numbers of occupant kilometres travelled, or hours travelled. The age-group 0-14 years is excluded because they have only been in the NTS for the last few years.

To compare the modal split, also the rates per occupant kilometre have been calculated; in the numerator, there is data from the Passenger Transport Statistics. Here it was possible to calculate each year of the period 1994-1996 separately.

The death and injury rates calculated here express the risk that the group concerned (a particular age-group or modal split) themselves run. One should realise that this calculation has certain limitations. It is therefore less suitable for answering some questions. This means that there can be large differences between the various means of transport (e.g. between so-called 'heavy traffic', such as lorries, and so-called 'slow traffic', such as cyclists).

5.1. Death and injury rates per occupant kilometre

The rates per occupant kilometre have been used to calculate the differences between the sexes and age-groups.

The injury rate for A&E treatment is almost 65 times greater than the death rate, and approximately 5 times greater than the in-patient rate.

The differences between males and females and between age-groups are large. This is also, of course, a result of other factors, such as differences in the modal split.

The rates for serious injury (death and in-patient) are higher for males than for females. The rates for A&E treatment are however for females, higher. The rates for serious injury (death and in-patient) are the highest for 65 years and older. The rates for A&E treatment however, are the highest for the group 15-24 years.

The combination of age and sex would seem to result in the highest rates for A&E treatment for 15-24 year old males. The rate for in-patients are the highest for females of 65 years and older. The death rate is the highest for male of 65 years and older.

To compare the various modal splits (means of transport) during the period 1994-1996, the rate per occupant kilometre have been calculated. In each of these three years, the death rates were the highest for mopedists and motorcyclists. The same applies to the in-patient rate; only here the mopedists had a much higher rate than the motorcyclists.

Deaths			
Age-group	Male	Female	Total
15-24	0.1520	0.0512	0.1055
25-39	0.0676	0.0297	0.0530
40-49	0.0478	0.0271	0.0403
50-59	0.0557	0.0359	0.0493
60-64	0.0821	0.0594	0.0725
65+	0.2445	0.1675	0.2059
Total	0.0884	0.0504	0.0730
In-patients			
15-24	2.1633	1.2094	1.7232
25-39	0.8189	0.6016	0.7354
40-49	0.6037	0.6072	0.6050
50-59	0.7185	0.9057	0.7907
60-64	0.7948	1.2733	0.9965
65+	2.0844	2.5745	2.3300
Total	1.0559	1.0023	1.0342
Accident & Emergency treatment			
15-24	11.1858	9.2453	10.2906
25-39	4.1467	4.0799	4.1210
40-49	2.4324	3.2083	2.7159
50-59	2.4187	3.9188	2.9975
60-64	2.2821	4.0532	3.0289
65+	3.5294	5.4689	4.5014
Total	4.4932	5.0462	4.7175

Table 5.1. *Death and injury rates per 10⁷ occupant kilometres, 1994-1996. Sources: Police, CBS, NTS (deaths), SIG, CBS, NTS (in-patients), sample of hospital Accident & Emergency departments, CBS, NTS (A&E treatment).*

Year	Modal split (means of transport)							
	Car	Van	Heavy traffic	Motorcycle	Moped	Bicycle	Pedestrian	Total
Death rate								
1994	0.04	0.04	0.02	0.59	0.78	0.2	0.22	0.07
1995	0.04	0.03	0.02	0.60	0.98	0.2	0.25	0.07
1996	0.04	0.03	0.02	0.57	0.86	0.2	0.20	0.06
In-patient rate								
1994	0.33	0.33	0.30	6.28	19.59	5.21	3.22	0.97
1995	0.33	0.33	0.28	8.06	21.24	5.43	3.04	0.99
1996	0.32	0.32	0.31	7.71	20.10	5.49	3.15	0.97

Table 5.2. *Death and in-patient rates per 10⁷ occupant kilometres, 1994 to 1996. Sources: Police, CBS-Statistics of passenger traffic (deaths), Police: SIG Health Care Information, CBS Statistics passenger traffic (in-patients).*

5.2. Death and injury rates per hour travelled

Comparisons of the death and injury rates between the groups result in differences when time travelled is used instead of kilometres travelled. This is clearest of all when comparing the 15-24 year-olds and the 65 years and older. Per kilometre travelled, the death rate is about twice as much for the 65 years and older than for the 15-24 year-olds; per hour travelled, their rates are almost equal. Per kilometre travelled, the A&E rate for 15-24 year-olds is more than double the rate for the 65 years and older, but per hour travelled this rate is four times as much. The 15-24 year-olds apparently travel the same distance in less time. This is probably a result of their higher degree of motorization.

Deaths			
Age-group	Male	Female	Total
15-24	0.3462	0.1077	0.2313
25-39	0.2037	0.0620	0.1365
40-49	0.1366	0.0493	0.0951
50-59	0.1415	0.0603	0.1026
60-64	0.1549	0.0734	0.1120
65+	0.3395	0.1775	0.2474
Total	0.2210	0.0880	0.1553
In-patients			
15-24	4.9201	2.5474	3.7801
25-39	2.4648	1.2577	1.8934
40-49	1.7259	1.1049	1.4310
50-59	1.7604	1.5216	1.6462
60-64	1.4965	1.5780	1.5393
65+	2.9030	2.7290	2.8040
Total	2.6389	1.7539	2.2021
A&E treatment			
15-24	25.4402	19.4734	22.5733
25-39	12.4808	8.5289	10.6099
40-49	6.9538	5.8376	6.4237
50-59	5.9265	6.5835	6.2407
60-64	4.2970	5.0233	4.6787
65+	4.9155	5.7970	5.4171
Total	11.2290	8.8305	10.0452

Table 5.3. *Death and injury rates per 10⁶ hours travelled, 1994-1996.*
Sources: Police, CBS, NTS (deaths), SIG Health Care Information, CBS, NTS (in-patients), A&E sample, CBS, NTS (A&E treatment).

6. Death and in-patient rates per kilometre, 1986-1996

The death and in-patient rates have been calculated for the period 1986-1996 (A&E treatment data is not available). In the denominator are the occupant kilometres from the Passenger Transport Statistics.

The rates for each means of transport (modal split), as well as the total have been calculated. All age-groups (including the 0-14 year-olds) are included.

Year	Modal split							
	Car	Van	Heavy traffic	Motor cycle	Moped	Bicycle	Pedestrian	Total
Death rate								
1986	0.06	0.06	0.02	0.71	0.74	0.26	0.44	0.10
1987	0.06	0.04	0.01	0.58	0.79	0.28	0.34	0.09
1988	0.05	0.04	0.02	0.69	0.69	0.24	0.42	0.08
1989	0.05	0.04	0.02	0.64	0.93	0.26	0.38	0.08
1990	0.05	0.04	0.01	0.65	0.63	0.23	0.29	0.08
1991	0.05	0.04	0.02	0.73	0.92	0.18	0.28	0.07
1992	0.04	0.03	0.02	0.72	0.86	0.19	0.29	0.07
1993	0.04	0.02	0.01	0.71	0.67	0.19	0.28	0.07
1994	0.04	0.04	0.02	0.59	0.78	0.20	0.22	0.07
1995	0.04	0.03	0.02	0.60	0.98	0.20	0.25	0.07
1996	0.04	0.03	0.02	0.57	0.86	0.18	0.20	0.06
In-patient rate								
1986	0.42	0.42	0.26	10.60	18.09	5.21	4.30	1.19
1987	0.41	0.41	0.28	8.86	18.66	5.39	4.12	1.14
1988	0.38	0.38	0.20	11.34	17.93	4.96	4.44	1.09
1989	0.36	0.36	0.22	9.99	21.76	5.15	4.11	1.09
1990	0.37	0.37	0.23	8.69	19.85	4.90	4.00	1.07
1991	0.34	0.34	0.17	8.41	19.33	4.86	3.51	0.96
1992	0.33	0.33	0.20	8.88	20.61	5.02	3.64	0.99
1993	0.35	0.35	0.27	7.59	17.52	5.22	3.50	1.00
1994	0.33	0.33	0.30	6.28	19.59	5.21	3.22	0.97
1995	0.33	0.33	0.28	8.06	21.24	5.43	3.04	0.99
1996	0.32	0.32	0.31	7.71	20.10	5.49	3.15	0.97

Table 6.1. *Death and in-patient rates per 10⁷ occupant kilometres, 1986 to 1996.*
Sources: Police, CBS-Passenger traffic statistics (deaths), Police: SIG Health Care Information, CBS Passenger Traffic Statistics (in-patients).

The death rates have gradually decreased since 1986. There was however a, probably temporary, stagnation during the years 1991-1995. The death rate in 1996 was lower than in 1986.

This lower death rate also applies to most means of transport; the exceptions are heavy traffic and mopeds.

The in-patient rates also declined during the period 1986-1991, and have since then stabilised (during the years 1992-1996). This decline also applies to most means of transport; the exceptions are heavy traffic, mopeds, and bicycles.

The death and in-patient rates calculated here are a measurement of the risk that the appropriate means of transport *themselves* run. It does not express the risk they present for *other* means of transport (see chapter 5).

7. Years of Life Lost (YLL), 1990 en 1994

The following data for years of life lost (YLL) by cause of death and their shares in the total, have been taken from a Ministry of Health study, published in 1997. The number of years lost for someone who has died is determined by the life expectancy at the time of death. The source is the CBS Death Statistics and Survival Tables 1990 and 1994, prepared by the Ministry of Health.

The same list of unnatural causes of death have been selected as those used in chapter 4:

- a. suicide;
- b. accidental fall;
- c. road accidents;
- d. violence;
- e. accidental drowning;
- f. accidental poisoning.

As this comparison is primarily aimed at injury as a result of an accident, suicide and violence are omitted.

Disorder	1990		1994	
	Absolute number	% share	Absolute number	% share
Suicide and automutilation	45697	37%	50316	41%
Violence	5995	5%	6652	5%
Accidents				
Road accidents	52592	42%	47511	38%
Accidental fall	12860	10%	12125	10%
Accidental drowning	5121	4%	4580	4%
Accidental poisoning	1932	2%	2538	2%
Total	124197	100%	123722	100%

Table 7.1. *Years of Life Lost (YLL) and the percentage share in the total, by cause of death, 1990 and 1994. Source: CBS Cause of Death Statistics and Survival Tables.*

If suicide and violence are omitted, the greatest number of lost years of life is the result of road accidents; although the number of road accidents has fallen since 1990.

In the comparison of mortalities from the same causes of death (see chapter 4, *Table 4.1*), the accidental falls were more important than road accidents. Road accidents, however, cause far more lost years of life than accidental falls because the average age of road deaths is much lower (younger). This is due to the large share of the 15-24 year-olds.

8. Costs of road accident injuries, 1993

The total costs of road accidents contain the following categories: medical costs, potential loss of production, material damage costs, settlement costs, traffic-jam costs, and social, 'human value' costs (with death and serious injuries).

Within this framework, the material damage costs have been omitted. Two other items, settlement and traffic-jam costs, could also partly be added. When they are the results of a material damage only (MDO) road accident, they should be omitted. There is no data available to calculate the shares of these two items accurately. Seeing the relatively small size of both these items (each is less than 4% of the total costs), we can make do with a rough estimate. The costs of traffic-jams have been completely omitted.

Category of costs	Total costs in millions of guilders per year
Medical costs	440
Potential loss of production	4346
Settlement costs	303
Subtotal	5089
Addition of immaterial costs after establishing gross/net correction for loss of production	2826
Total	7915

Table 8.1. *Up-dated estimation (in millions of guilders) of the costs of traffic injuries, 1993. Source: SWOV 1995 en 1996.*

In the SWOV-report *Costs of Road Safety in the Netherlands, 1993* (Muizelaar a.o., 1995) the costs of road accidents for 1993 were calculated, but without the Material Damage Only (MDO) accidents.

In the report *Financing a sustainably-safe road transport system* (Poppe & Muizelaar, 1996) an estimation of social costs was made, based on the 'willingness-to-pay' method, and using data from foreign countries.

The total costs of traffic injuries (the total costs minus the material damage costs) amounted in 1993 to almost 8 billion guilders.

9. International comparisons

International data for a number of the above-mentioned road safety indicators does exist.

The numbers of road deaths in 1980, 1990, and 1994 for the member countries of the European Union (EU) come from the International Road Traffic and Accident Database (IRTAD) of the OECD.

The mortality figures (deaths per 100,000 population) also come from IRTAD.

The death rates per vehicle kilometre could not be calculated for most of the EU member countries because the numbers of kilometres travelled for most of the means of transport are seldom known. The kilometrages of motorised traffic is, in the most countries, known. A 'second best' solution was therefore chosen; namely the death rate per *motorvehicle* kilometre were calculated. This was done partly because, to a certain degree, it is a measurement (or indicator) of the risk for the vulnerable road users (mopedists, cyclists, and pedestrians). Most of the deaths of vulnerable road users are the result of a collision with bigger, heavier, and faster vehicles.

The death rates per motorvehicle kilometre (deaths per 10⁸ km.) in 1980, 1990, and 1994 for the member countries of the EU are taken from the FER-SI report: *Road safety research and policy in Europe* (1996).

The costs of road accident victims (deaths, heavily injured, and lightly injured), for the EU member states in 1990, are taken from the ETSC report: *Cost of transport accidents and the value of safety* (1996).

9.1. Absolute size of the road safety in the EU, 1990-1994

46,479 road deaths occurred in the whole EU in 1994. This was considerably less than in 1980, when 64,199 people were killed. This decrease occurred in all member countries except Greece. The largest numbers of road deaths are to be found in Germany, France, and Italy.

Deaths (absolute numbers)			
Country	year		
	1980	1990	1994
Belgium	2396	1976	1692
Denmark	690	634	546
Germany	15050	11046	9814
Great Britain	6239	5402	3807
Finland	551	649	480
France	13672	11215	9019
Greece	1409	1998	2195
Ireland	564	478	404
Italy	9220	7151	7104
Luxemburg	98	70	74
Netherlands	1996	1376	1298

Deaths (absolute numbers)			
Country	year		
	1980	1990	1994
Austria	2003	1558	1338
Portugal	2941	3017	2504
Spain	6522	9032	5615
Sweden	848	772	589
Total	64199	56374	46479

Table 9.1. *International comparisons between the countries of the European Union: absolute numbers of deaths. Source: SWOV: IRTAD.*

9.2. Mortality in the EU, 1980-1994

The numbers of deaths per 100,000 population differs greatly between the member countries of the EU. In 1994, the mortality was the highest in Portugal and Greece. Only Sweden and Great Britain have a lower mortality than the Netherlands. Since 1980, the mortality has fallen in all member countries except Greece.

Deaths (per 100,000 population)			
Country	year		
	1980	1990	1994
Belgium	24,31	19.86	16.75
Denmark	13.47	12.35	10.51
Germany	19.25	13.96	12.07
Great Britain	11.08	9.38	6.52
Finland	11.55	13.05	9.45
France	25.45	19.92	15.6
Greece	14.61	19.66	21.06
Ireland	16.58	13.65	11.39
Italy	16.35	12.42	12.43
Luxemburg	27	18.52	18.5
Netherlands	14.17	9.24	8.46
Austria	26.55	20.26	16.69
Portugal	31.54	32.21	26.59
Spain	17.65	23.2	14.35
Sweden	10.21	9.05	6.74

Table 9.2. *International comparisons between the countries of the European Union: deaths per 100,000 population. Source: SWOV: IRTAD.*

9.3. Death rates per motorvehicle kilometres in the EU, 1980-1994

The numbers of motor vehicle kilometres is known for most of the countries of the EU. For the other countries, the estimates in the FERSI report have been used.

The death rate varies a lot between the countries. In 1994 it was the highest in Greece, Portugal, and Spain. Only Great Britain, Sweden, and Finland had a lower death rate than the Netherlands.

The death rate has fallen considerably since 1980 in all countries. Then also, the Netherlands belonged to the safest countries in Europe (together with the above-mentioned countries plus Denmark).

Country	Deaths per 10 ⁸ km		
	1980	1990	1994
Belgium	4.99	2.81	2.13
Denmark	2.50	1.73	1.37
Germany	3.73	2.00	1.66
Great Britain	2.22	1.28	0.88
Finland	2.06	1.63	1.15
France	4.41	2.57	1.85
Greece*	-	-	6.43
Ireland	2.84	1.92	1.42
Italy	3.67	1.91	1.69
Luxemburg*	-	-	1.63
Netherlands	2.67	1.41	1.20
Austria	5.63	2.79	2.10
Portugal*	-	-	5.31
Spain	9.03	7.89	4.19
Sweden	1.73	1.20	0.92
Total	3.84	2.35	1.80

*For Greece, Luxemburg en Portugal no data is available; these have been estimated.

Table 9.3. Number of deaths per 10⁸ vehicle kilometre for the EU-member countries. Source: FERSI.

9.4. Costs of traffic injuries in the EU, 1990

In the already mentioned ETSC report, an estimate was made, using a uniform method for the first time ever, of the costs of all road accident injuries. For those countries where figures were not available, the numbers were estimated based on the data of the countries most similar who did have the data. Therefore the damage through loss of 'human value' could also be taken into account.

The total costs of road accident injuries for the whole EU in 1990 amounted to more than 90 billion ECU.

Country	In 10 ⁶ ECU
Belgium	3557
Denmark	666
Germany	36562
Great Britain	11071
Finland	1246
France	9532
Greece	779
Ireland	402
Italy	13873
Luxemburg	126
Netherlands	2587
Austria	3864
Portugal	2233
Spain	4336
Sweden	1482
Total	90834

Table 9.4. *Social costs of deaths and injuries in the EU-member countries, 1990. Source: ETSC.*

Literature

- Maas, I.A.M., Gijsen, R., Lobbezoo, I.E. & Poos, M.J.J.C. (1997). *Volksgezondheid Toekomst Verkenning 1997*. RIVM Rijksinstituut voor Volksgezondheid en Milieu / Elsevier, Maarssen.
- Muizelaar, J., Mathijssen, M.P.M. & Wesemann, P. (1995). *Kosten van de verkeersonveiligheid in Nederland, 1993*. SWOV, Leidschendam
- Poppe, F. & Muizelaar, J. (1996). *Financiering van een duurzaam-veilig wegverkeerssysteem*. SWOV, Leidschendam.
- FERSI Forum of European Road Safety Research Institutes (1996). *Road safety research and policy in Europe*. FERSI secretariat, Leidschendam.
- ETSC European Transport Safety Council (1997). *Transport accident costs and the value of safety*. ETSC, Brussels