

## PEDESTRIANS AS A RISK GROUP IN TRAFFIC SAFETY IN YUGOSLAVIA<sup>\*)</sup>

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In recent years the traffic accidents in Yugoslavia are becoming very actual health, economic and social problem, as our country, according to the World Health Organization, is within the group of countries with the biggest growth of numbers of traffic accidents during the period 1955-1974 (Conference on the Epidemiology of Road Accidents, Vienna, 1975). In existing conditions of rapid industrialisation and urbanisation of our country dynamic change in the cause of illness, invalidity and mortality of the population is obvious. It has been reflected to the structure of mortality in which the traffic accidents are just after cardio-vascularis and malignity deceases (5). The fast development of traffic and permanent trend in growth of number of the motor vehicles and drivers jeopardize the safety of people especially the pedestrians as one of the risk group among traffic participants who are very often the victims. As it has been confirmed by other authors the pedestrians could be very often those who cause the accidents (2). A special problem is the invalidity of injureds in the traffic what has been proved by the works of authors who found out that the invalids in the observation groups could be up to 20% (6). The aim of the investigation is to discover the most risk group of population according to their ages among injured and killed pedestrians, as well as to suggest a system of preventive health measures for these groups at risk.

### The material and the methods

The details about the vehicles, drivers and injureds in the traffic for the period 1970-1974 have been got from the Federal Secretariat for interior affaires. During the investigation descriptiv and analitic epidemiology method, with the help of statistic, had been used.

The group of 69.592 injured and killed pedestrians had been analised according to consequences, ages, places and causes of accidents.

### Results and discussion

The dynamic growth of the number of drivers, vehicles and injureds

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and killed was reflected to the unfavorable epidemiological situation of the traffic accidents in Yugoslavia. It is shown in the table N<sup>o</sup> 1.

THE DINAMIC GROWTH OF THE NUMBER OF DRIVERS,  
VEHICLES AND INJURED IN YUGOSLAVIA FOR THE PERIOD  
Table N<sup>o</sup> 1 OF 1970-1974

Year	number of drivers	number of vehicles	number of injureds and killed
1970	1.778.257	1.293.655	53.651
1971	1.900.993	1.475.439	58.658
1972	2.054.639	1.602.893	58.812
1973	2.211.807	1.732.464	53.651
1974	2.432.291	1.885.895	56.081

The analise of injureds and killed within period of five years (tab. N<sup>o</sup> 2) shows the growht of average of injureds and killed from 1970-1972. In 1973 the epidemiological situation was better, but in 1974 the problem arose again. The new traffic laws which were introduced in 1972 and 1974 had the positive influence to the number of injured and killed in the traffic accidents (3, 9).

INJURED AND KILLED IN YUGOSLAVIA FROM 1970-1974  
(RATES ON 100.000 INHABITANTS)

Table N<sup>o</sup> 2

Year	killed	injured	total
1970	3684 17,95	49967 243,42	53651 261,37
1971	4200 20,48	54458 265,58	58658 286,06
1972	4460 21,50	54352 262,05	58812 283,55
1973	3684 17,60	49967 238,71	53651 256,31
1974	4161 19,70	51920 245,76	56081 265,46
Average 1970- -1974	4038 19,44	52133 251,05	56171 270,49

Within period 1970-1972 the number of injured and killed pedestrians was increasing while in the years after the tendency of decrease in both number of injured and killed was obvious within the same special observed risk group of pedestrians (tab. N<sup>o</sup> 3). As it has been shown the average of rates of killed (7,19‰) and injured (59,82‰) pedestrians is very high within the five year period. It requires the urgent and effective measures which must be undertaken by the society.

INJURED AND KILLED PEDESTRIANS IN YUGOSLAVIJA  
(RATES ON 100.000 INHABITANTS)

Table N<sup>o</sup> 3

Year	killed	injured	total
1970	1409 6,92	11889 58,36	13298 65,28
1971	1510 7,35	12530 60,96	14040 68,31
1972	1638 7,90	12620 60,84	14258 68,74
1973	1525 7,28	12656 60,46	14181 67,74
1974	1394 6,60	12421 58,79	13815 65,39
Average 1970- -1974	1495 7,20	12423 59,82	13918 67,02

If we analyse the number of pedestrians according to their ages who were killed or injured within five years the most risk group among injureds (105,80‰) are the children between 5-7 years of age (tab. N<sup>o</sup> 4) while in the structure of those who were killed the predominant group represent the pedestrians over 65 years of age (21,35‰). The other pedestrians are usually injured from 29,71-66,10‰ and killed from 3,17-10,08‰.

Judging by the given results we can conclude that psiho-physical conditions and physiological characteristics of the young bodies help the injureds to survive, while the biological characteristics of the olds who suffers also of other illnesses and degenerative processes, cause the death. That was proved also by some other authors (1, 4, 7, 8).

The topographical analisation of the suffering of the pedestrians (tab. N<sup>o</sup> 5) shows that the accidents are usually hapen in the populated urban areas 84,50% during the crossing (68,09%). Among them the biggest number are children between 5-7 years (76,49%) and olds (73,84%). By taking the wrong side of the road 15,50% of pedestrians are usually injured in the open road.

These analyses show that the education of pedestrians is urgent by different means such as scientific lectures, announcements in the newspaper, illustrated by pictures and other means of information.

Within observed period of five years the pedestrians are victims in about 25% of accidents, but on the other side they are very often those who cause the accidents. By analysing the pedestrians' faults (tab. N° 6) the sudden crossing is predominant, especially by children between 5-7 years of age (47,12%). The pedestrians over 65 years of age (34,24%) are usually injured when passing the road out of pedestrian crossing.

Preventive measures are in three ways:

- health and traffic education with before-school population through the family and kindergarten;
- health and traffic education with old people through the newspapers, TV, radio etc;
- traffic regulation in urban area and traffic education in driving population.

### Conclusion

The pedestrians represent one of the risk groups of the traffic participants in Yugoslavia. They are victims in 25% of accidents. It has been noticed that in the total number of injured who participate with 105,800,000 children between 5-7 years of age are dominant, while in the structure of those who were killed, dominant population group consists of people over 65 years of age (21,350,000).

The topographical analysis of the suffering of pedestrians shows that the places of accidents are, in most cases, populated areas (84,50%) during the crossing (68,09%). In the open roads 15,50% pedestrians suffer especially during the irregular move along the roads.

The analyses of the pedestrians' faults show that the sudden crossing the roads by children between 5-7 years of age, is predominant causes of accidents (47,12%). Passing the roads out of pedestrian crossings are usually faults of pedestrians over 65 years of age with 34,24%.

In the conclusion the authors suggest the system of preventive health measures towards those risk groups.

PEDESTRIANS AS VICTIMS IN ROAD ACCIDENTS IN YUGOSLAVIA IN 1970-1974, ACCORDING TO AGE  
Table N<sup>o</sup> 4 (RATES ON 100,000 INHABITANTS)

Years	A g e g r o u p s											
	0-4		5-7		8-14		15-18		19-64		65 above	
	killed	injured	killed	injured	killed	injured	killed	injured	killed	injured	killed	injured
1970	72 3,9	499 27,3	90 8,1	1083 97,9	115 4,3	1593 60,0	53 3,3	903 56,2	704 6,1	6260 54,0	317 20,0	1226 77,3
1971	59 3,3	519 28,7	119 10,7	1159 104,5	124 4,7	1799 68,5	53 3,3	1026 63,4	775 6,6	6497 55,2	336 20,5	1255 77,7
1972	66 3,7	551 30,8	136 12,3	1231 111,2	136 5,2	1737 66,5	46 2,9	923 58,1	812 6,8	6417 53,6	379 22,5	1399 83,1
1973	63 3,5	554 30,9	113 9,4	1282 107,1	146 5,6	1785 68,5	56 3,6	825 53,1	685 5,6	6422 52,8	418 24,2	1526 88,3
1974	59 3,3	555 30,8	106 9,8	1175 108,3	105 4,0	1748 67,2	40 2,6	902 59,2	680 5,5	6274 50,8	346 19,5	1403 79,1
1970- -1974 average	64 3,5	536 29,7	113 10,1	1186 105,8	125 4,8	1732 66,1	50 3,2	916 58,0	731 6,1	6374 53,3	359 21,3	1362 81,0

PEDESTRIANS AS VICTIMS IN ROAD ACCIDENTS IN YUGOSLAVIA IN 1970-1974, ACCORDING TO AGE  
 Table N<sup>o</sup> 5 AND SITE OF ACCIDENT

Age groups	in urban regions			on open road				TOTAL
	on crossing roads	on pavement	on movement on roads	total	on crossing roads	on movement on roads	total	
0-4	1823 68,64%	118 4,44%	715 26,92%	2656 88,62%	247 72,43%	94 27,57%	341 11,38%	2997
5-7	4268 76,49%	148 2,65%	1164 20,86%	5580 85,93%	696 76,15%	218 23,85%	914 14,07%	6494
8-14	5611 72,23%	259 3,33%	1898 24,44%	7768 83,63%	883 58,09%	637 41,91%	1520 16,37%	9288
15-18	2509 61,78%	300 7,39%	1252 30,83%	4061 84,13%	280 36,55%	486 63,45%	766 15,87%	4827
19-64	19400 65,14%	1940 6,52%	8440 28,34%	29780 83,83%	2292 39,89%	3454 60,11%	5746 16,17%	35526
65 above	5444 73,84%	251 3,40%	1678 22,76%	7373 85,68%	681 55,27%	551 44,73%	1232 14,32%	8605
unknown	987 62,11%	135 8,50%	467 29,39%	1589 85,66%	125 46,99%	141 53,01%	266 14,34%	1855
Total	40042 68,09%	3151 5,36%	15614 26,55%	58807 84,50%	5204 48,25%	5581 51,75%	10785 15,50%	69592

Table N° 6

## PEDESTRIANS FAULTS IN YUGOSLAVIA IN 1970-1974, ACCORDING TO AGE

Faults	0-4	5-7	8-14	15-18	19-64	65 above	unknown
Crossing the road on cross-roads	14 0,67%	59 1,19%	116 1,83%	141 5,79%	804 4,87%	216 4,17%	30 2,84%
Crossing the road off cross-roads	674 32,20%	1487 30,12%	2132 33,74%	786 32,28%	5692 34,50%	1772 34,24%	344 32,61%
Sudden crossing of the road	921 44,00%	2326 47,12%	2592 41,02%	855 35,11%	4786 29,01%	1444 27,90%	296 28,06%
Irregular movement on roads	339 16,20%	706 14,30%	979 15,49%	398 16,34%	2503 15,17%	518 10,01%	134 12,70%
Effect of alcohol	4 0,19%	5 0,10%	10 0,16%	44 1,81%	955 5,79%	502 9,70%	105 9,95%
Illness	9 0,43%	22 0,44%	29 0,46%	18 0,74%	275 1,67%	338 6,53%	17 1,61%
Other	132 6,31%	331 6,70%	461 7,29%	193 7,93%	1484 8,99%	385 7,44%	129 12,23%
TOTAL	2093	4936	6319	2435	16499	5175	1055

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