ROAD RESEARCH LABORATORY

Department of the Environment

RRL REPORT LR 431

AGES OF CAR DRIVER CASUALTIES IN 1970

by

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Ownership of the Transport Research Laboratory was transferred from the Department of Transport to a subsidiary of the Transport Research Foundation on 1st April 1996.

AGES OF CAR DRIVER CASUALTIES IN 1970

ABSTRACT

Of the male car drivers killed or injured between 10 pm and 4 am, when it is nearly always dark, about one-half are under 25 years of age. Between 10 am and 4 pm, when it is almost always light, the proportion is about one-quarter, while during the rest of the day nearly 30 per cent of the casualties are under 25.

These differences probably arise from corresponding differences in the amounts of travel, and, because the dark hours are more dangerous they contribute to the high accident rate of young drivers. This report estimates this contribution.

It was assumed that during the above dark hours the casualty rate for drivers of any one age group is double that during the day hours, and during the mixed hours (4 am to 10 am and 4 pm to 10 pm) is 25 per cent above it. It was then found that if the distances driven by young (under 25 years of age) car drivers was distributed over the day in the same way as for older drivers, their casualty rate would be about 9 per cent lower than it is at present. It would, however, still be more than 2½ times the rate of older drivers.

1. INTRODUCTION

Previous investigations[1,2] have shown that the casualty rate (ie casualties per unit distance travelled) and accident involvement rate of car drivers is highest among young drivers, the fatal and serious casualty rate of drivers under 25 years old being 3 times that of older drivers; it has also been shown that accident rates for all vehicles are higher during the hours of darkness than during daylight hours[3,4].

It has been suggested that part of the higher casualty rate among young car drivers may be due to their driving a greater proportion of their total distance during the hours of darkness. This has been investigated and reported on previously, using data on fatal and serious casualties among car drivers during 1968. Since 1969 data on age of car driver casualties have become available for all severities of injury, so the investigation has been repeated using 1970 data. No statistics are available of the distribution of car travel throughout the day by age of driver. If, however, it can be shown that a higher proportion of driver casualties by night are in the younger age groups this will tend to support the hypothesis.

2. CASUALTY RATES BY AGE

Munden[2] used the results of a motoring survey carried out in England and Wales during 1961 to show the number of fatal and serious injuries per unit distance travelled is much higher for young car drivers than for older drivers.

Using the results of a National Travel Survey carried out by the Ministry of Transport in 1966 the proportion of the total car distance travelled by drivers of different ages has been calculated, and these figures have been compared with the numbers of car drivers killed and seriously injured in the same age groups during the same year (see Table 1). The age groups differ somewhat from those in ref 2, but the results confirm that, per unit distance travelled, fatal and serious injuries occur more frequently among younger car drivers than among the higher age groups. The casualty rate for drivers under 21 years old is 4.26 times the average for all ages. This is of the same order as the rate for drivers under 20 years of age, of 4.62 times the average, given in ref 2.

It is not readily possible to quote standard errors for the various rates since these depend not only on the magnitude of the numbers involved but also on the variation in the distances travelled in the population. Thus it is probable that the general shape of the relationship between casualty rate and age is as indicated, and the fact that the rate is higher for the age group 50–59 than for the neighbouring groups is not statistically significant.

3. CAR DRIVER CASUALTIES IN 1970

The numbers of car driver casualties occurring during 1970 are shown in Table 2, in which the proportion under 25 years of age (young drivers) has been expressed as a percentage of all car driver casualties, separately for 3 groups of time of day. During the hours 10 pm to 4 am, which are dark during almost the whole year, about one-half the male car driver casualties are less than 25 years old, during both summer and winter, while during the hours 10 am to 4 pm (nearly always light) the proportion is about one-quarter. During the remaining hours, which are sometimes light and sometimes dark, the proportion is nearly 30 per cent. The proportions of female car drivers who are under 25 years of age are a little below those for males in all cases, but show the same large difference in the proportions in light and dark hours.

4. DISCUSSION

It has been shown above that young (under 25 years) car drivers incur a higher proportion of their casualties during the hours of darkness than do older drivers. If certain assumptions are made it is possible to estimate the proportion of the casualty rate of young drivers which may be due to their driving more at night.

Firstly, it is assumed that the casualty rate (ie casualties per unit distance driven) during the dark is twice that during the day, for both young drivers and older drivers, and secondly, that the rate during the remaining hours (4 am to 10 am and 4 pm to 10 pm) is 25 per cent higher than during the day.

From Table 2 the numbers of casualties to male car drivers under 25 years old are

Nearly always light (10 am to 4 pm)	2,238 + 1,957	=	4,195
Nearly always dark (10 pm to 4 am)	4,473 + 4,176	=	8,649
Other hours	4,902 + 3,773	=	8,675
Total			21,519

Taking the relative casualty rate by day to be unity then the distance driven by males under 25 years old would, on the above assumptions, be distributed in the proportions:-

Light	4,195	=	4,195	(Rate = 1)
Dark	8,649 / 2	=	4,324	(Rate = 2)

Other hours	$\frac{8,675}{1.25}$	=	6,940	(Rate = 1.25)
Total			15,459	

and the overall rate would be $\frac{21,519}{15,459}$ = 1.39 times the rate in daylight.

Similarly, the overall rate for male car drivers aged 25 or over (again taking the day rate as unity) is:

$$\frac{12,522 + 9,008 + 20,963}{12,522 + 4,504 + 16,770} = \frac{42,493}{33,796} = 1.26$$

times the rate in daylight.

On the above assumptions, therefore, if the kilometres driven by young drivers had been distributed throughout the day in the same way as the travel of older drivers their casualty rate would be $\frac{1.26}{1.39} \times 100 = 91$ per cent of the observed rate.

The casualty rate of car drivers under 25 years old is about 3 times that of car drivers aged 25 or over, thus a reduction of 9 per cent to allow for the effect of driving in the dark would still leave the rate of young drivers more than 2½ times that of older drivers.

5. ACKNOWLEDGEMENTS

This report was prepared in the Accident Analysis Section of the Safety Division. The distribution of car travel by age of driver in 1966 was derived from data supplied by Mr A S Maultby of DOE.

6. REFERENCES

1. DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH, ROAD RESEARCH LABORATORY. Research on road safety. London, 1963 (HM Stationery Office), pp 119–123.

2. MUNDEN, J M. The accident rates of car drivers by age. *Int Rd Saf Traff Rev,* 1966, 14 (1), 28–9.

3. TANNER, J C, and A J HARRIS. Street lighting and accidents. Some British investigations. *Internat Comm illum CIE , 13th Session,* 1955, Vol II, Paper G–T.

4. MINISTRY OF TRANSPORT, ROAD RESEARCH LABORATORY. Road Research 1964. The report of the Road Research Board with the report of the Director of Road Research. London, 1966 (HM Stationery Office), p 51.

TABLE 1

Car driver casualty rates in 1966

Age Group	Percentage of car km (based on National Travel Survey)	Total car km driven (10^8)	Fatal and serious car driver casualties*	Fatal & serious casualties per 10^8 car km	Relative rates
Under 21	3.75	47.44	3,113	65.6	4.26
21 – 29	18.31	231.64	6,063	26.2	1.70
30 – 39	26.41	334.11	3,642	10.9	0.71
40 – 49	26.03	329.30	2,945	8.9	0.58
50 – 59	16.52	208.99	2,358	11.3	0.73
60 – 64	5.32	67.30	685	10.2	0.66
65 and over	3.66	46.30	704	15.2	0.99
Total	100.00	1265.08	19,510	15.4	1.00

* A few casualties of unknown age have been distributed proportionately among the age groups

TABLE 2

Casualties to car drivers during 1970

a) Winter (January, February, March, October, November, December)

Time	Male			Female		
	Aged under 25 years	All ages	% under 25	Aged under 25 years	All ages	% under 25
10 am to 4 pm	2,238	9,209	24.3	681	3,490	19.5
10 pm to 4 am	4,473	9,330	47.9	486	1,064	45.7
Other hours	4,902	16,951	28.9	1,196	4,415	27.1
Total	11,613	35,490	32.7	2,363	8,969	26.3

b) Summer (April to September inclusive)

Time	Male			Female		
	Aged under 25 years	All ages	% under 25	Aged under 25 years	All ages	% under 25
10 am to 4 pm	1,957	7,508	26.1	622	2,989	20.8
10 pm to 4 am	4,176	8,327	50.2	449	966	46.5
Other hours	3,773	12,687	29.7	996	3,771	26.4
Total	9,906	28,522	34.7	2,067	7,726	26.8

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