Proceedings of the Iowa Academy of Science

Volume 65 | Annual Issue

Article 64

1958

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Recommended Citation

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Problem

By implication this is a progress report of a study of fatal traffic accidents in Iowa. The purpose is to develop a system for improving methods of analysis of accident data. Thus it was decided to tabulate fatality victims each year by age and sex and also by classification as to whether the person was a driver, passenger, or pedestrian in an attempt to assign responsibility for mishaps.

Each year about this time it is proper for us to pause and take stock of our progress, or lack of progress as the case may be, in the field of traffic safety and accident reduction. The total accident picture is often enough presented to us by the State Department of Public Safety, but seems quite blithely ignored by the general public. Last year there were 690 fatalities reported due to motor vehicles. There were 21,236 other persons seriously injured. This means that for every person killed there were 31 persons injured. The property damage loss alone was $35,680,573 resulting from a total of around 56,998 accidents. But we need more detailed accident facts before we can really attack our accident problem effectively.

In 1953 Siebrecht (6) wrote, "The need for such a study (of specific accident involvement) becomes apparent when one notes the lack of information regarding the driving and accident patterns of motor vehicle operators at the various ages, and when one observes the current practice of generalizing from group data regarding accident involvement of specific age groups as well as the rather uniform practice of referring to youthful teen-age drivers as the troublesome group."

This, unfortunately, is still true in 1958. To find specific information on either sex at any given age has been virtually impossible. Furthermore, little or no attention was given to the problem of passenger fatalities, and scarcely any more to pedestrians. It was thus thought advisable to further test the null hypothesis that there is no difference between the distribution of ages of fatality victims and the distribution of ages of persons throughout the range of the population.

Method and Procedure

In this the third year of a five year project involving the analysis of Iowa street and highway fatalities, the same pattern was followed

as in the original study presented before the Academy in 1956 (4). The raw data were obtained from the State Department of Public Safety of Iowa for the year 1957 and were plotted with respect to the age and sex of the fatality victims as well as to their activities at the time they were killed. This year, however, drivers as a group were also tabulated by ages as to whether they were involved in a collision or non-collision type of accident. Of the 690 people reported by the State Department of Public Safety as fatality victims, the following table summarizes the results:

Table 1

	Drivers	Passengers	Pedestrians
Male	343	106	47
Female	45	135	14
Collision	213		
Non-collision	175		

This shows the primary data analysis as tabulated. The next procedure was to compute the mean ages of each group and to test certain significances of difference found. The distribution of the total population was used as the hypothesis. The chi-square test was made to determine the goodness of fit, and Edwards' statistical model (1) was used as the basis of calculation of the chi-square.

RESULTS

Table 2, or the distribution of persons by age and sex, readily shows the nature of these various distributions. Significant excesses for male drivers were noted in the 15-19, 20-24, 25-29, and 65-69 year old groups. For female drivers no marked excesses beyond the expected were noted; the only approach to significance was between ages 20-24.

Critical ratios were calculated between the mean ages of the respective groups, as shown in Table 3, in an effort to determine the significance of any difference noted in age. Only the difference between male drivers and male passengers was found significant at the 1 per cent level, and between male passengers and female passengers at the 5 per cent level. Once again this table shows that the average age of victims is at the prime of life. Chi-square tests were made to determine whether or not the distributions of fatality frequencies fit that of the distribution of ages of persons in the population. These values were all significant beyond the 1 per cent level, except that for female drivers. For five groups, then, the hypothesis of no difference between distributions is rejected.

DISCUSSION

Several facts seem to stand out in this examination of data. It is predominantly males who are killed in auto accidents; only 28 per

Table 2

Analysis and Comparison by Population Groups
(On basis of 1955 census estimates)

	Male				Female			
	Per cent of Population in Group	Drivers	Passengers	Pedestrians	Per cent of Population in Group	Drivers	Passengers	Pedestrians
0-4 incl.	.1124	0	10	5	.1068	0	9	2
5-14 incl.	.1847	2	11	15	.1753	1	11	1
15-19 incl.	.0696	39	14	0	.0666	4	16	0
20-24 incl.	.0680	44	24	0	.0662	6	11	0
25-29 incl.	.0727	40	6	0	.0738	4	7	1
30-34 incl.	.0750	27	4	1	.0770	2	6	0
35-39 incl.	.0699	24	4	1	.0717	3	7	0
40-44 incl.	.0675	20	2	1	.0690	5	3	0
45-49 incl.	.0607	22	8	3	.0610	4	7	2
50-54 incl.	.0532	24	1	0	.0537	4	9	1
55-59 incl.	.0471	23	2	3	.0482	4	10	0
60-64 incl.	.0399	17	3	2	.0411	4	11	2
65-69 incl.	.0316	27	4	2	.0331	3	14	4
70-74 incl.	.0229	15	7	5	.0260	0	6	1
75-79 incl.	.0137	11	3	2	.0162	1	4	0
80-84 incl.	.0071	4	2	1	.0088	0	3	0
85 & over	.0039	4	1	6	.0055	0	1	0
Totals		343	106	47		45	135	14
Mean		42.0	32.0	41.3		41.2	40.5	46.8
Median		39	23	46		44	39.5	56
Range		11-89	0-90	2-90		14-76	0-85	3-71
S.D.		19.3	23.3	32.4		17.1	23.7	24.0

Table 3

Evaluation of Differences in Age of Fatal Accident Victims

	Victim	Sex	Mean Age	Victim	Sex	Mean Age	Difference	C.R.
1.	Driver	M	42.0	Passenger	M	32.0	10.0	3.997**
2.	Driver	M	42.0	Pedestrian	M	41.3	0.7	0.144
3.	Passenger	M	32.0	Pedestrian	M	41.3	9.3	1.786
4.	Driver	F	41.2	Passenger	F	40.5	0.8	0.231
5.	Driver	F	41.2	Pedestrian	F	46.8	5.5	0.803
6.	Passenger	F	40.5	Pedestrian	F	46.8	6.3	0.936
7.	Driver	M	42.0	Driver	F	41.2	0.8	0.273
8.	Passenger	M	32.0	Passenger	F	40.5	8.5	2.779*
9.	Pedestrian	M	41.3	Pedestrian	F	46.8	5.5	0.689

cent of all the fatalities both last year and as a three year total were female. The age of drivers is somewhat higher than for the last two years. The record for the 18 year olds remains about the same, however. All 14 of the 18 year old male drivers who lost their lives in 1957 died in *noncollision* accidents. There was some improvement shown in the number of unlicensed drivers over previous years under study. In 1956 and 1957 more women were involved as driv-

ers in fatal accidents, but percentage-wise, remain the same. Nearly one-half of the fatal accidents last year were non-collision. Non-collision fatal accidents are particularly numerous between the ages of 20 and 25. (Wisconsin (8) reports similar findings with regard to single-car, non-collision type accidents.) Collision accidents increase after age 45, to the point where after age 65 there is a preponderance of collision accidents.

As far as passenger fatality victims are concerned, they are still about equally divided between male and female as would be expected. Passenger fatalities are usually significantly younger than driver fatalities. The year 1957 showed a sharp increase in the numbers of young male adult passengers killed.

This past year fewer children and more middle-aged and older persons lost their lives as pedestrians. As usual many more males lost their lives as pedestrians than did females, at both extremes of the age scale.

Summary and Conclusions

Thus the 1957 analysis of fatal motor vehicle accident victims in Iowa supports the following original conclusions:

1. The mean age of motor vehicle accident victims is in the prime of life.

2. That fatalities do not always follow according to numbers in the population group by age. Some groups have more than expected and others have less.

3. Male and female passengers are equally likely to be killed in an accident, especially at the younger and the older ages.

4. There seems to be a greater tendency for males at the younger age to be killed than for females, both as drivers and as pedestrians. This is probably due in part to the masculine characteristic of aggressiveness.

The only original statement not supported in 1956 and 1957 was that female driver fatality victims were somewhat older than male driver fatality victims.

There is a growing tendency for more older males to be killed as drivers and as pedestrians. Perhaps this is due not only to masculine aggressiveness but to somewhat faster moving automobiles when driven by men. They overdrive their limitations.

It would seem that preventive measures to cut down on our terrible traffic toll would have to involve educating and re-educating drivers to bring about a change in their attitudes, an increase in their knowledge, and a better interpretation of driving and driving conditions. Pedestrians must begin practicing defensive walking, which

also involves the same basic knowledge required of a driver. Both groups must avoid illegal and reckless actions which frequently result in disaster. Passengers have the least control over their fate, being trapped in a vehicle under the control of someone else, but again basic knowledge of a driver's and a vehicle's limitations can be of help.

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