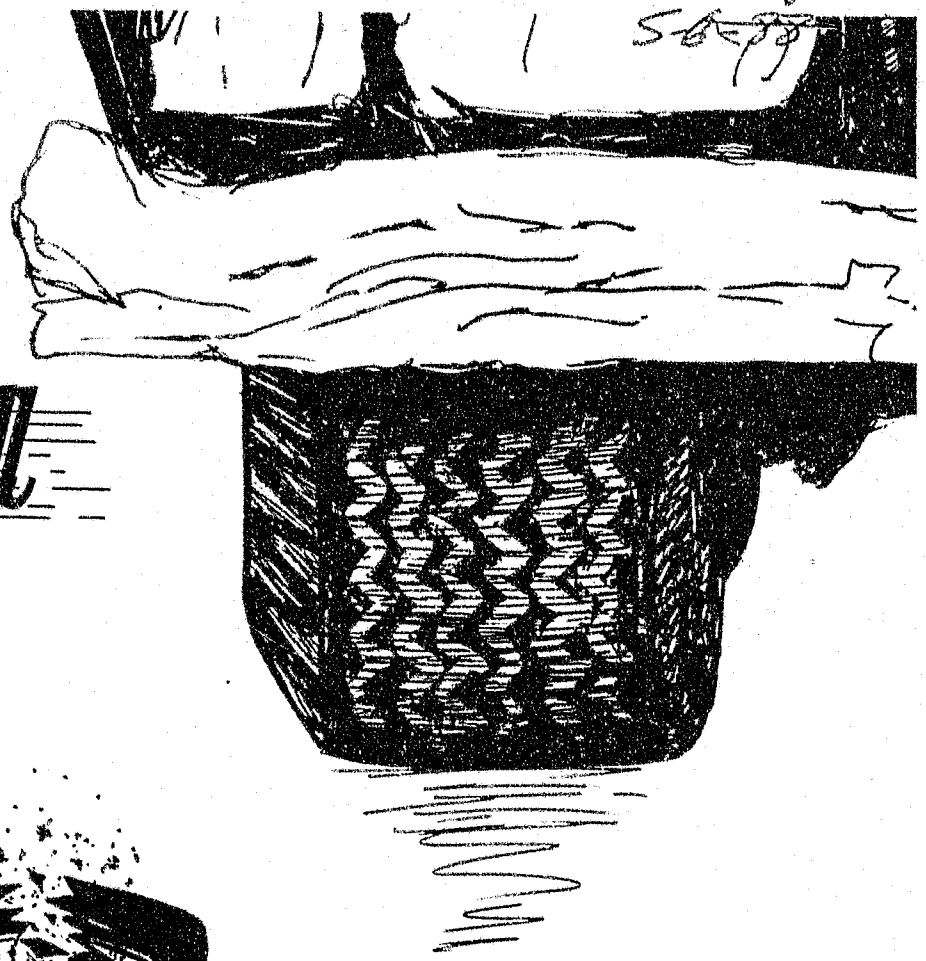

Blood Alcohol Testing for

or Vehicle Deaths

Wisconsin 1985

isconsin Department of Health and Social Services
Division of Health, Center for Health Statistics

BLOOD ALCOHOL TESTING

FOR MOTOR VEHICLE DEATHS

Wisconsin, 1985

Division of Health

Center for Health Statistics

R. D. Nashold . . . . . Director

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July 1986

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SUMMARY

1. Drivers of cars and trucks accounted for 302 of the 494 fatalities tested for blood alcohol in 1985 and motorcyclists for 42. Although testing of passenger deaths is not required, 93 were processed. The balance of the tests were for pedestrians (31), snowmobilers (13), boaters (5), operators of tractors and other equipment (4), and bicyclists (4). (Page 9)

2. Relevant evidence on the issue of intoxication (blood alcohol concentration of 0.05% or higher) was found for 47.6 percent of all highway fatalities tested in 1985. For 41.7 percent of these, blood alcohol concentrations (BACs) were of a level to constitute prima facie evidence of intoxication (0.10+%). This pattern has been substantially unchanged since the inception of the blood alcohol testing program in 1968. (Page 9)

3. Of those with significant blood alcohol concentration (0.05+%), the proportion male was 85.1 percent and female 14.9 percent. (Page 11)

4. Alcohol involvement was highest among drivers of motorcycles (71.4 percent) then drivers of cars and trucks (48.3 percent) followed by pedestrians (41.9 percent) and passengers (37.6 percent). (Page 11)

DRIVERS/MOTORCYCLISTS

5. Among driver/motorcyclist fatalities tested, the proportion of alcohol involvement was high for ages 24 and under (61.7 percent) and 25-44 (62.2 percent), but lowest for those 45 years of age and older (23.7 percent), significantly lower than all younger age groups. No significant differences appears among any age groups under 45. However, if age categories are collapsed into under 35 and 35 and older, the former (younger) group is significantly higher than the latter (older) group. (Page 17)

6. A significantly larger proportion of fatalities in nighttime accidents, (76.3 percent) than daytime accidents (16.7 percent) involved alcohol. Alcohol involvement increased during the evening to a high of 82.1 percent in the period from midnight to six A.M. (Page 24)

7. Alcohol involvement was more frequent among Saturday and Sunday fatalities (66.9 percent) than among those occurring Monday through Friday (42.6 percent). For 1985 there was no significant association with holiday weekends. The proportion of tested fatalities with alcohol involvement shows no seasonal differencials. (Page 26)

INTRODUCTION

This report has been prepared as part of the requirement of Wisconsin Statute 346.71(2) which specifies that the Division of Health, without revealing individual identity, shall disseminate and make public the results of blood alcohol tests of motor vehicle operators or pedestrians 16 years of age or older killed on Wisconsin highways.

Under Wisconsin Statute 885.235, if chemical analysis shows that there was 0.05 percent or less by weight of alcohol in a person's blood, it is prima facie evidence that he was not under the influence of this intoxicant; if the analysis shows more than 0.05 percent but less than 0.10 percent, it is relevant evidence on the issue of intoxication; and if 0.10 or more percent alcohol is found, it is taken as prima facie evidence of intoxication. Therefore, these groupings of blood alcohol concentration are emphasized in this report.

The main focus of the report is on drivers of cars, trucks and motorcycles, who account for 344 of the 494 reports processed in 1985. The second largest group of reports (93) is for passengers, although the statute does not specifically require blood testing of passengers killed. The balance of the reports are for pedestrians (31), snowmobilers (13), boaters (5), operators of tractors and other equipment (4), and bicyclists (4).

Data have been obtained from reports sent to the Division of Health by county coroners or medical examiners.

Statutes on Blood Alcohol Tests

There are two relevant sections in Wisconsin Statutes related to blood alcohol testing; the latest revision was in 1985.

Section 346.71(2) Coroners or medical examiners to report; require blood specimen.

In cases of death involving a motor vehicle in which the decedent was the operator of a motor vehicle or a pedestrian 16 years of age or older and who died within 6 hours of the time of the accident, the coroner or medical examiner shall require that a blood specimen of at least 10 cc. be withdrawn from the body of the decedent within 12 hours after his or her death, by the coroner or medical examiner or by a physician so designated by the coroner or medical examiner or by a qualified person at the direction of such physician. All funeral directors shall obtain a release from the coroner or medical examiner prior to proceeding with embalming any body coming under the scope of this section. The blood so drawn shall be forwarded to a laboratory approved by the department of health and social services for analysis of the alcoholic content of such blood specimen. The coroner or medical examiner causing the blood to be withdrawn shall be notified of the results of each analysis made and shall forward the results of each such analysis to the department of health and social services. If the death involved a motor vehicle, the department shall keep a record of all such examinations to be used for statistical purposes only and the department shall disseminate and make public the cumulative results of the examinations without identifying the individuals involved. If the death involved an all-terrain vehicle, the department of natural resources shall keep a record of all such examinations to be used for statistical purposes only and the department of natural resources shall disseminate and make public the cumulative results of the examinations without identifying the individuals involved.

Section 885.235 Chemical tests for intoxication

(1) In any action or proceeding in which it is material to prove that a person was under the influence of an intoxicant or had a blood alcohol concentration of 0.1% or more when operating or driving a motor vehicle, or while handling a firearm, evidence of the amount of alcohol in the person's blood at the time in question, as shown by chemical analysis of a sample of the person's blood or urine or evidence of the amount of alcohol in the person's breath, is admissible on the issue of whether he or she was under the influence of an intoxicant or had a blood alcohol concentration of 0.1% or more if the sample was taken within 3 hours after the event to be proved. The chemical analysis shall be given effect as follows without requiring any expert testimony as to its effect:

(a) 1. Except as provided in subd. 2, the fact that the analysis shows that there was 0.05% or less by weight of alcohol in the person's blood or 0.05 grams of alcohol or less in 210 liters of the person's breath is prima facie evidence that the person was not under the influence of an intoxicant and did not have a blood alcohol concentration of 0.1% or more.

2. The fact that the analysis shows that there was more than 0.0% but less than 0.1% by weight of alcohol in the person's blood or more than 0.0 grams but less than 0.1 grams of alcohol in 210 liters of the person's breath is relevant evidence on the issue of being under the combined influence of alcohol and a controlled substance or any other drug but is not to be given any prima facie effect.

(b) The fact that the analysis shows that there was more than 0.05% but less than 0.1% by weight of alcohol in the person's blood or more than 0.05 grams but less than 0.1 grams of alcohol in 210 liters of the person's breath is relevant evidence on the issue of intoxication or blood alcohol concentration but is not to be given any prima facie effect;

(c) The fact that the analysis shows that there was 0.1% or more by weight of alcohol in the person's blood or 0.1 grams or more of alcohol in 210 liters of the person's breath is prima facie evidence that he or she was under the influence of an intoxicant and is prima facie evidence that he or she had a blood alcohol concentration of 0.1% or more.

(1m) In any action under s. 346.63 (2m), evidence of the amount of alcohol in the person's blood at the time in question, as shown by chemical analysis of a sample of the person's blood or urine or evidence of the amount of alcohol in the person's breath, is admissible on the issue of whether he or she had a blood alcohol concentration in the range specified in s. 346.63 (2m) if the sample was taken within 3 hours after the event to be proved. The fact that the analysis shows that there was more than 0.0% but not more than 0.1% by weight of alcohol in the person's blood or more than 0.0 grams but not more than 0.1 grams of alcohol in 210 liters of the person's breath is prima facie evidence that the person had a blood alcohol concentration in the range specified in s. 346.63 (2m).

(2) The concentration of alcohol in the blood shall be taken prima facie to be three-fourths of the concentration of alcohol in the urine.

(3) If the sample of breath, blood or urine was not taken within 3 hours after the event to be proved, evidence of the amount of alcohol in the person's blood or breath as shown by the chemical analysis is admissible only if expert testimony establishes its probative value and may be given prima facie effect only if the effect is established by expert testimony.

(4) The provisions of this section relating to the admissibility of chemical tests for intoxication or blood alcohol concentration shall not be construed as limiting the introduction of any other competent evidence bearing on the question of whether or not a person was under the influence of an intoxicant, had a blood alcohol concentration of 0.1% or more or had a blood alcohol concentration in the range specified in s. 346.63 (2m).

(5) In this section:

(a) "Blood alcohol concentration of 0.1% or more" means a blood alcohol concentration of 0.1% or more by weight of alcohol in a person's blood or 0.1 grams or more of alcohol in 210 liters of a person's breath.

(b) "Controlled substance" has the meaning specified in s. 161.01 (4).

(c) "Drug" has the meaning specified in s. 450.06.

ESTIMATED PERCENT OF ALCOHOL IN THE BLOOD BY NUMBER OF DRINKS IN RELATION TO BODY WEIGHT

Body Weight	Number of Drinks *											
	1	2	3	4	5	6	7	8	9	10	11	12
100 lbs.	.038	.075	.113	.150	.188	.225	.263	.300	.338	.375	.413	.450
120 lbs.	.031	.063	.094	.125	.156	.188	.219	.250	.281	.313	.344	.375
140 lbs.	.027	.054	.080	.107	.134	.161	.188	.214	.241	.268	.295	.321
160 lbs.	.023	.047	.070	.094	.117	.141	.164	.188	.211	.234	.258	.281
180 lbs.	.021	.042	.063	.083	.104	.125	.146	.167	.188	.208	.229	.250
200 lbs.	.019	.038	.056	.075	.094	.113	.131	.150	.169	.188	.206	.225
220 lbs.	.017	.034	.051	.068	.085	.102	.119	.136	.153	.170	.188	.205
240 lbs.	.016	.031	.047	.063	.078	.094	.109	.125	.141	.156	.172	.188

* One drink equals one vol. oz. of 100-proof whiskey or one 12-oz. bottle of beer.

Note: Subtract from the above the percent alcohol burned up during time elapsed since first drink, that is, 0.015% for each hour.

Source: Adapted from table produced by New Jersey Department of Law and Public Safety.

INTOXICATION AS DEFINED BY WISCONSIN LAW

Percent of Blood Alcohol	
.000 to .050	Prima Facie Evidence That You Are Not Intoxicated
.051 to .099[a/]	Relevant Evidence That You May Be Intoxicated
.100 to .149	Prima Facie Evidence That You Are Intoxicated
.150 and above	

a/ Most scientific articles, United States reports, and reports from other states read "0.05 or more"; however, the Wisconsin statute reads "more than 0.05", perhaps inadvertantly making Wisconsin statute slightly less stringent. The same Wisconsin statute also reads "0.10 or more" which is consistent with the way it is read elsewhere, suggesting again that the reading "more than 0.05" in Wisconsin statute should for consistency actually read "0.05 or more". The latter interpretation does not significantly change any category of information in this report. We have chosen to use "0.05 or more" in this report to make the data comparable to most other literature.

Limitations

Determinations of blood alcohol concentration (BAC) have been made for traffic fatalities occurring each year since the inception of the testing program in 1968. Those fatalities tested are not representative of all victims of traffic crashes, however, since the provisions of the statutes exclude persons below 16 years of age and those who died six hours or more after the time of the accident. Testing of passenger fatalities is not mandatory. Since 1970 an average of 75 percent of the driver/motorcyclist fatalities were tested each year; in 1985, 73.7 percent were tested. In order to be considered a valid measure, the blood specimen must have been taken within 12 hours after the death of the victim.

Table 1

DRIVER/MOTORCYCLIST DEATHS TESTED
Wisconsin, 1968-1985

Year	Number Tested	Percent of All Driver/Motorcyclist Deaths
1968	423	n.a.
1969	422	n.a.
1970	439	70.1
1971	479	77.6
1972	441	71.6
1973	481	89.1
1974	329	64.0
1975	345	70.1
1976	351	67.0
1977	420	81.7
1978	437	75.9
1979	494	79.4
1980	482	81.0
1981	444	66.7
1982	378	80.9
1983	376	83.0
1984	397	75.6
1985	344	73.7

Source: Division of Motor Vehicles, Accident Data Section.

For approximately 54 percent of the deaths tested each year of the program, the blood alcohol concentration was 0.05% or higher; it was 0.10% or higher in about 47 percent of those tested.* Research indicates that such figures are unlikely to represent the actual situation, however.** It has been found that the more complete the testing for alcohol among fatalities, the lower the portion with high BAC levels. This results from the operation of three factors:

(a) Exclusion of child victims (under 16) from the testing program.

(b) Exclusion of those who survive longer than six hours. (It has been found that such persons tend not to have been drinking.)

(c) Subjective judgment in obtaining samples from otherwise eligible cases may result in selective non-testing of fatalities in which it is assumed that "alcohol was not involved."

The absence of tests on individuals who are less likely to have been drinking inflates the proportion, among those tested, with high blood alcohol levels. In other words, data available through programs for testing traffic fatalities show considerably higher proportions with high BACs than if all victims were tested.

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* Refer to footnote a/, p. 4.

** Richard Zylman, Overemphasis on alcohol may be costing lives, The Police Chief, Vol. 41 (1), January 1974, 64-67

Interpretation of Small Frequencies

The number of deaths tested in specific categories, such as type of fatality, age group and road class, are generally small. Interpretations based on such small frequencies must be made with considerable caution, since they are subject to random fluctuation which may be substantial.* As an example, the underlying conditions which resulted in 42 motorcyclist fatalities in 1985 might have produced 23 or 61 deaths instead. Statistical considerations indicate that the chances are 19 in 20 that between 29 and 55 deaths might have resulted from the same underlying conditions.

In particular, calculations such as percentages based on small frequencies give an exaggerated impression of the number of cases involved and are subject to large random error.** In the same example, in 30 of the 42 motorcyclist deaths tested (71.4 percent) the blood alcohol concentrations exceeded 0.05%. The chances are 19 in 20 that the same underlying conditions which produced this result could have produced percentages between 57 percent and 85 percent. Percents have therefore not been calculated for fewer than 20 individuals. The number "20" in arbitrary, however, and is not set forth as a critical point distinguishing statistically reliable rates.

Statements based on statistical significance tests, however, take random error into account and assess the significance of a particular association against the background of expected random fluctuation. When statistical tests are cited in this report, the p value given indicates the level of significance at which the null hypothesis (no association) is rejected. Where no probability is specified, the significant test value is p=.05.

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* Vital Statistics of the U.S., Vol. 1, 1959, p. 1-20.

** Donald Mainland, Elementary Medical Statistics, Philadelphia: W.B. Saunders Company, 1964.

ALL TRAFFIC DEATHS

Type of Fatality

Blood Alcohol Concentration (BACs) of 0.05% or higher were found for 235 persons tested and concentrations of 0.10% or higher, for 206 persons. Thus, BAC determinations were of a level to constitute prima facie evidence of intoxication in 87.7 percent of those individuals in which relevant evidence of intoxication was demonstrated. Twenty-eight of the driver deaths tested had BAC levels over 0.25%, indicative of marked intoxication,* as did nine passengers, six motorcyclists and four pedestrian deaths. Nineteen decedents, including nine drivers, had BACs as high as 0.30% or over.

Table 2

TRAFFIC DEATHS BY BLOOD ALCOHOL CONCENTRATION (BAC)
AND TYPE OF FATALITY
Wisconsin, 1985

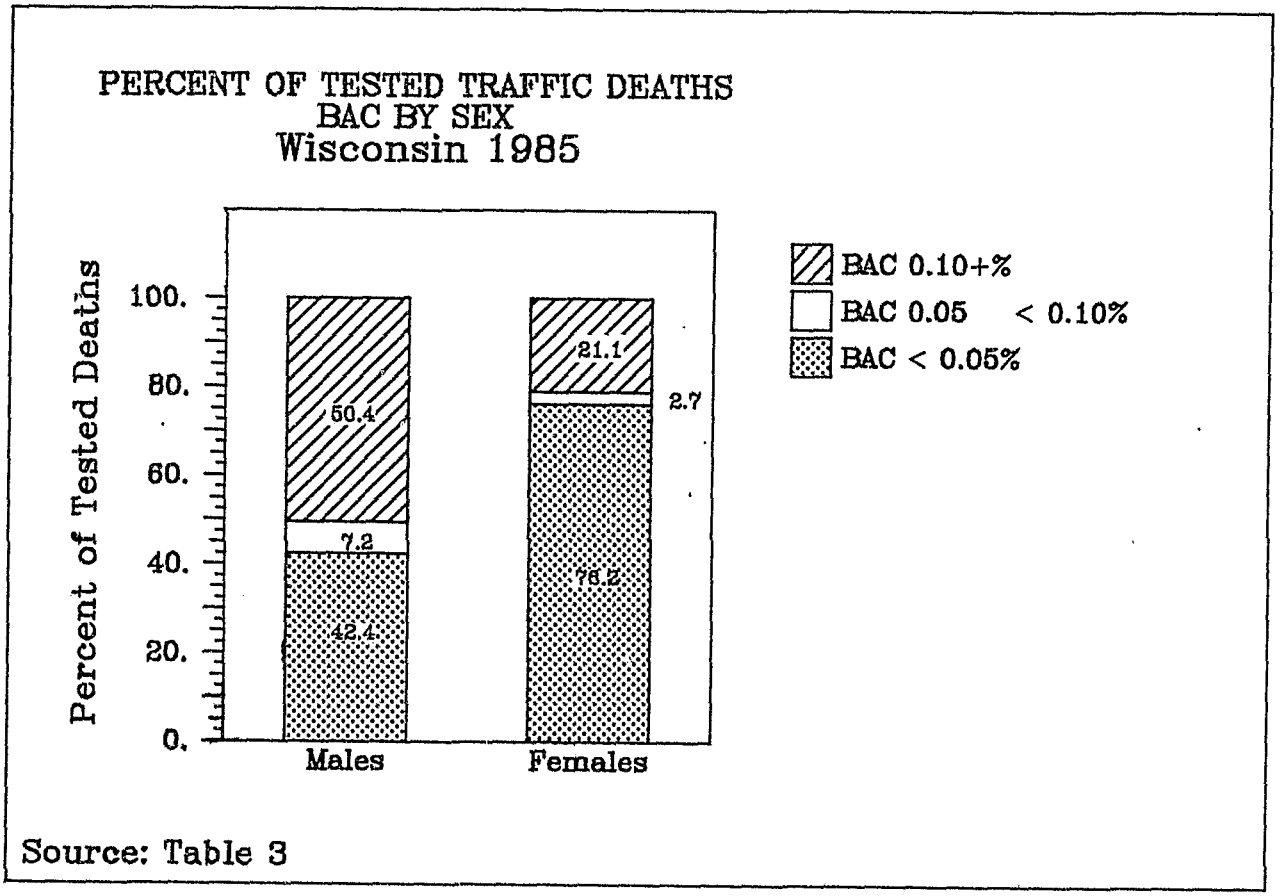
Type of Fatality	Total Deaths Tested	Blood Alcohol Concentration								
		No Alcohol	.001-.049	.050-.099	.100-.149	.150-.199	.200-.249	.250-.299	.300-.349	.350+
All Traffic Deaths Tested	494	242	17	29	46	60	53	28	15	4
Drivers a/	302	154	2	20	22	36	40	19	6	3
Passengers a/	93	48	10	4	10	11	1	5	3	1
Pedestrians	31	18			1	4	4	1	3	
Motorcyclists b/	42	7	5	4	7	5	8	3	3	
Other c/	26	15		1	6	4				

a/ Includes automobiles, trucks, buses and similar vehicles.
b/ Includes motorscooters.
c/ Includes snowmobilers, bicyclists, boaters and unknowns.

*Leon L. Blum, Blood Alcohol, Journal of the Indiana State Medical Association, 64(4), 1971, 311-312.

Type of Fatality and Sex

The proportion of tested traffic deaths with BACs of 0.10% or higher follows substantially the same pattern with respect to factors such as type of fatality, sex,age and road class, as does the proportion with BACs 0.05% or higher. The percent of all tested traffic deaths with significant BAC levels (0.05+%) is over twice as high among males than among females. Males also have much higher alcohol involvement by type of fatality. However, since the proportion of males among tested decedents is different for drivers (71.2 percent), passengers (53.8 percent), pedestrians (64.5 percent) and motorcyclists (95.2 percent), the high incidence of significant alcohol involvement among males affects the combined rates (both sexes) differently by type of fatality. For instance, the combined rate for motorcyclists is influenced more by the male rate than is the combined rate for passengers. Thus, comparisons should not be made between type of fatalities unless sex is taken into account.



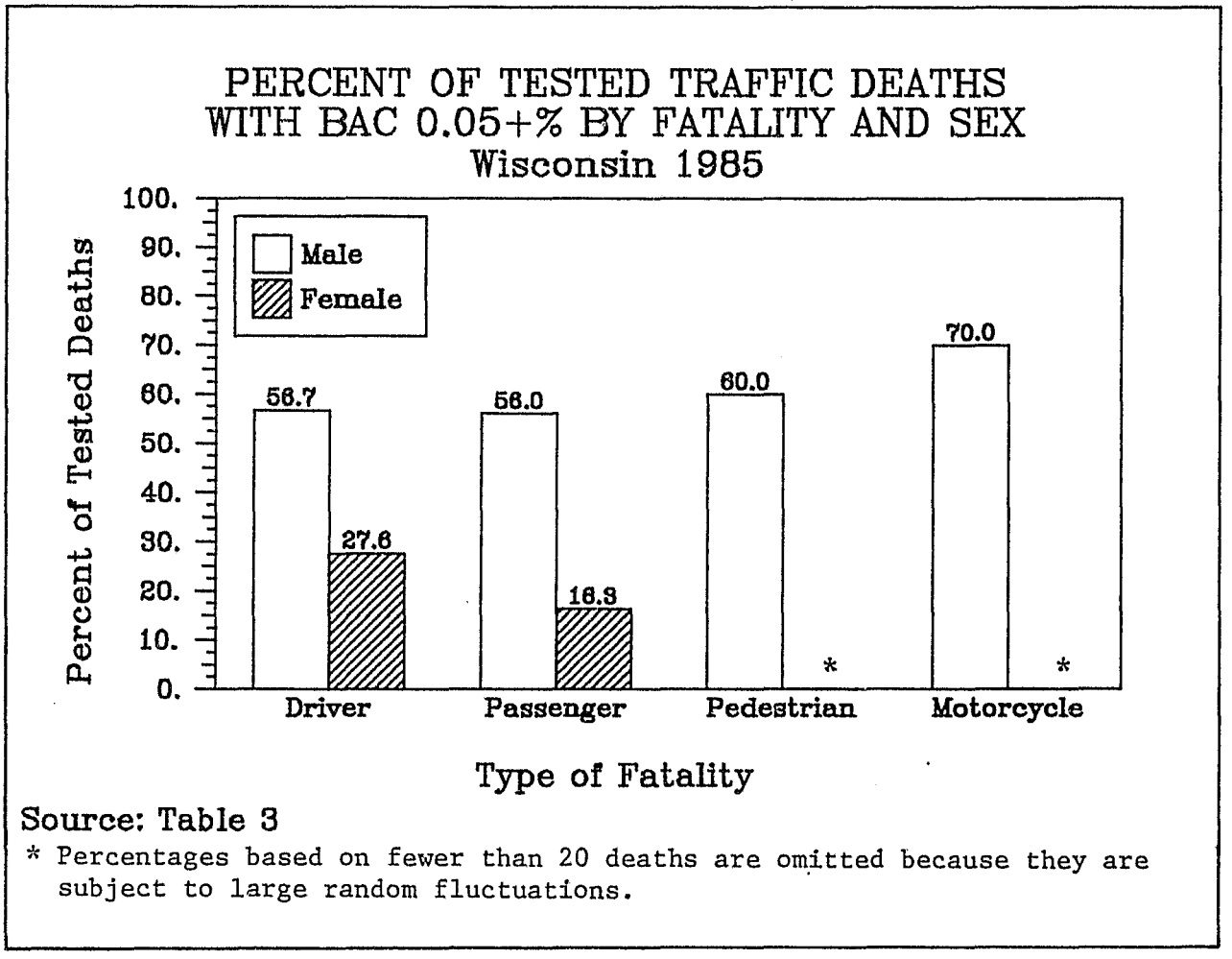
Source: Table 3

Table 3

TRAFFIC DEATHS BY BLOOD ALCOHOL CONCENTRATION (BAC), TYPE OF FATALITY AND SEX
Wisconsin, 1985

Type of Fatality	Total			Males			Females		
	Total* Tested	BAC 0.05+%	BAC 0.10+%	Total* Tested	BAC 0.05+%	BAC 0.10+%	Total* Tested	BAC 0.05+%	BAC 0.10+%
All Traffic Dths.	494	235	206	347	200	175	147	35	31
Drivers a/	302	146	126	215	122	106	87	24	20
Passengers a/	93	35	31	50	28	24	43	7	7
Pedestrians	31	13	13	20	12	12	11	1	1
Motorcyclists b/	42	30	26	40	28	24	2	2	2
Other c/	26	11	10	22	10	9	4	1	1

* Decedents with BAC less than 0.05% included in total only.
a/ Includes automobiles, trucks, buses and similar vehicles.
b/ Includes motorscooters.
c/ Includes snowmobilers, bicyclists, boaters and unknown.



Source: Table 3

* Percentages based on fewer than 20 deaths are omitted because they are subject to large random fluctuations.

Type of Fatality, Age and Sex

Persons tested within the age groups 16-24 and 25-44 accounted for 71.8 percent of the driver/motorcyclists, 65.6 percent of the passengers and 45.2 percent of the pedestrians. Persons 65 and older comprised 38.7 percent of the pedestrians tested, 21.5 percent of the passengers and 10.5 percent of the driver/motorcyclists.

Table 4

TRAFFIC DEATHS BY BLOOD ALCOHOL CONCENTRATION (BAC), TYPE OF FATALITY, AGE AND SEX
Wisconsin, 1985

Type of Fatality and Age	Total			Males			Females		
	Total* Tested	BAC 0.05+%	BAC 0.10+%	Total* Tested	BAC 0.05+%	BAC 0.10+%	Total* Tested	BAC 0.05+%	BAC 0.10+%
Drivers a/									
All Ages	344	176	152	255	150	130	89	26	22
16-24	120	74	66	92	64	57	28	10	9
25-44	127	79	69	95	67	59	32	12	10
45-64	61	20	16	42	17	14	19	3	2
65-74	21	2	1	17	1		4	1	1
75+	15	1		9	1		6		
Passengers									
All Ages	93	35	31	50	28	24	43	7	7
16-24	39	22	18	28	17	13	11	5	5
25-44	22	11	11	13	9	9	9	2	2
45-64	12	2	2	4	2	2	8		
65-74	12			2			10		
75+	8			3			5		
Pedestrians									
All Ages	31	13	13	20	12	12	11	1	1
16-24	3	1	1	2	1	1	1		
25-44	11	7	7	9	6	6	2	1	1
45-64	5	3	3	3	3	3	2		
65-74	8	2	2	3	2	2	5		
75+	4			3			1		

* Decedents with BAC less than 0.05% included in total only.
a/ Includes motorcyclists.

Type of Fatality and Health System Agencies

Among Health Systems Agencies there were no statistically significant differences in the percent of tested fatalities with appreciable BAC. Values ranged from a low of 35.7 percent BAC exceeding 0.05% in HSA 3 to a high of 63.2 percent in HSA 7.

Table 5

TRAFFIC DEATHS BY BLOOD ALCOHOL CONCENTRATION (BAC), TYPE OF FATALITY FOR HEALTH SYSTEM AGENCIES
Wisconsin, 1985

(Occurrence data)

Type of Fatality	Total* Tested	BAC 0.05+%	BAC 0.10+%	Total* Tested	BAC 0.05+%	BAC 0.10+%
	HSA 1 - (HPC)			HSA 2 - (SEWHSA)		
All Traffic Deaths	121	54	48	113	60	48
Drivers a/	91	42	37	80	51	39
Passengers	22	8	8	19	4	4
Pedestrians	3	1	1	13	5	5
Other	5	3	2	1		
	HSA 3			HSA 4		
All Traffic Deaths	42	15	13	56	28	25
Drivers a/	29	10	9	38	23	20
Passengers	8	2	1	10	3	3
Pedestrians	2	1	1	4	1	1
Other	3	2	2	4	1	1
	HSA 5 - (WWHSA)			HSA 6 - (NCAHPA)		
All Traffic Deaths	75	31	26	68	35	34
Drivers a/	51	21	19	44	23	22
Passengers	16	8	5	13	7	7
Pedestrians	5	1	1	2	2	2
Other	3	1	1	9	3	3
	HSA 7 - (HSA/WLS)					
All Traffic Deaths	19	12	12			
Drivers a/	11	6	6			
Passengers	5	3	3			
Pedestrians	2	2	2			
Other	1	1	1			

* Decedents with BAC less than 0.05% included in total only.
a/ Includes motorcyclists.

DRIVER/MOTORCYCLIST DEATHS

Time Trends

Appreciable levels of blood alcohol were found for 176 of the 344 driver/motorcyclist deaths tested in 1985 or 51.2 percent. The two years with the lowest proportion of driver/motorcyclist deaths tested with blood alcohol levels exceeding 0.05% were 1985 with 51.2 percent and 1972 with 51.5 percent. The two highest proportions were in 1979 with 62.3 percent and 1976 with 62.7 percent.

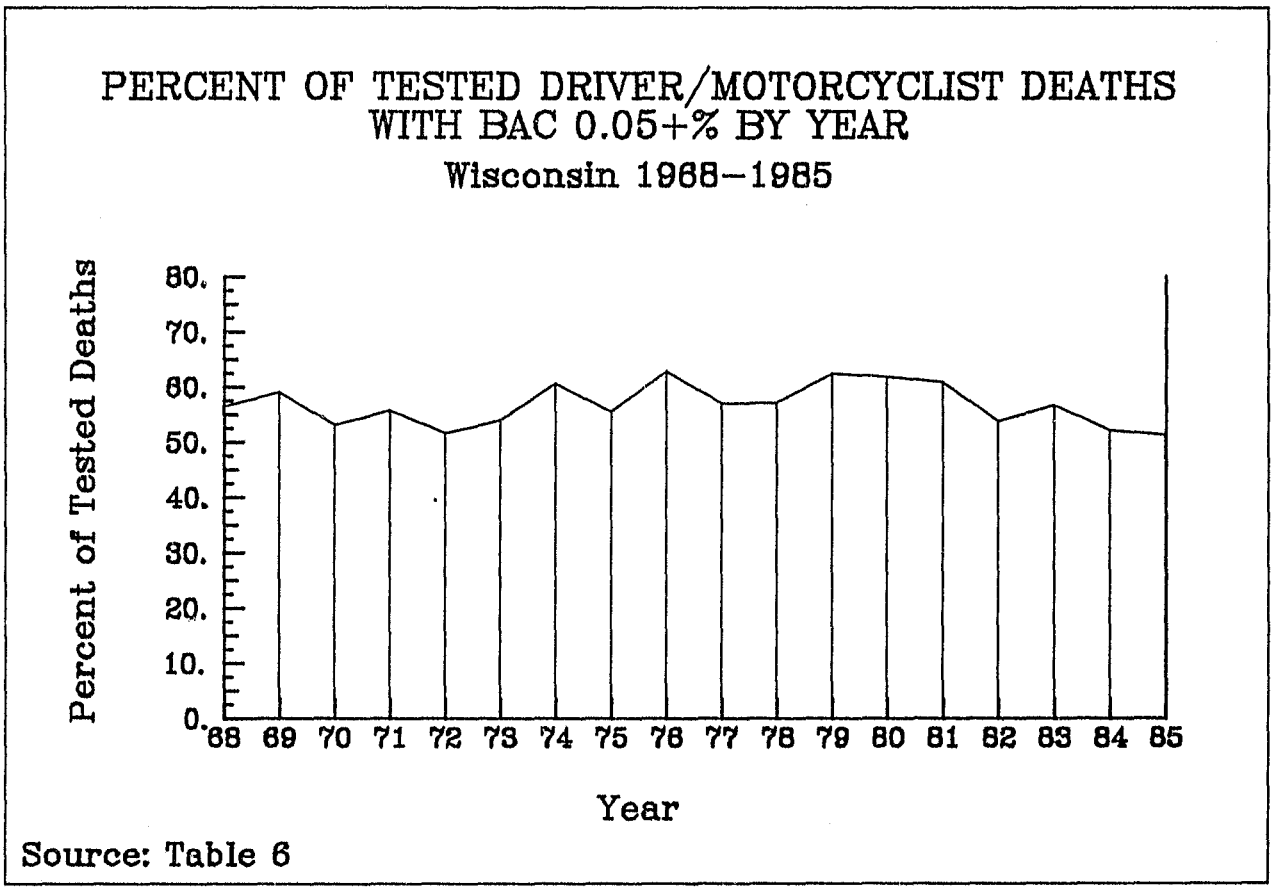
Table 6

DRIVER a/ DEATHS BY BLOOD ALCOHOL CONCENTRATION (BAC) AND YEAR
Wisconsin, 1968-1985
(Occurrence data)

Year	Total Deaths Tested*	BAC 0.05+%	BAC 0.10+%
1968	423	238	205
1969	422	249	203
1970	439	233	200
1971	479	267	232
1972	441	227	201
1973	481	259	233
1974	329	199	173
1975	345	191	168
1976	351	220	204
1977	420	239	219
1978	437	249	224
1979	494	308	277
1980	482	298	267
1981	444	270	244
1982	378	203	182
1983	376	213	195
1984	397	207	189
1985	344	176	152

* Decedent with BAC less than 0.05% included in total only.
a/ Includes motorcyclists.

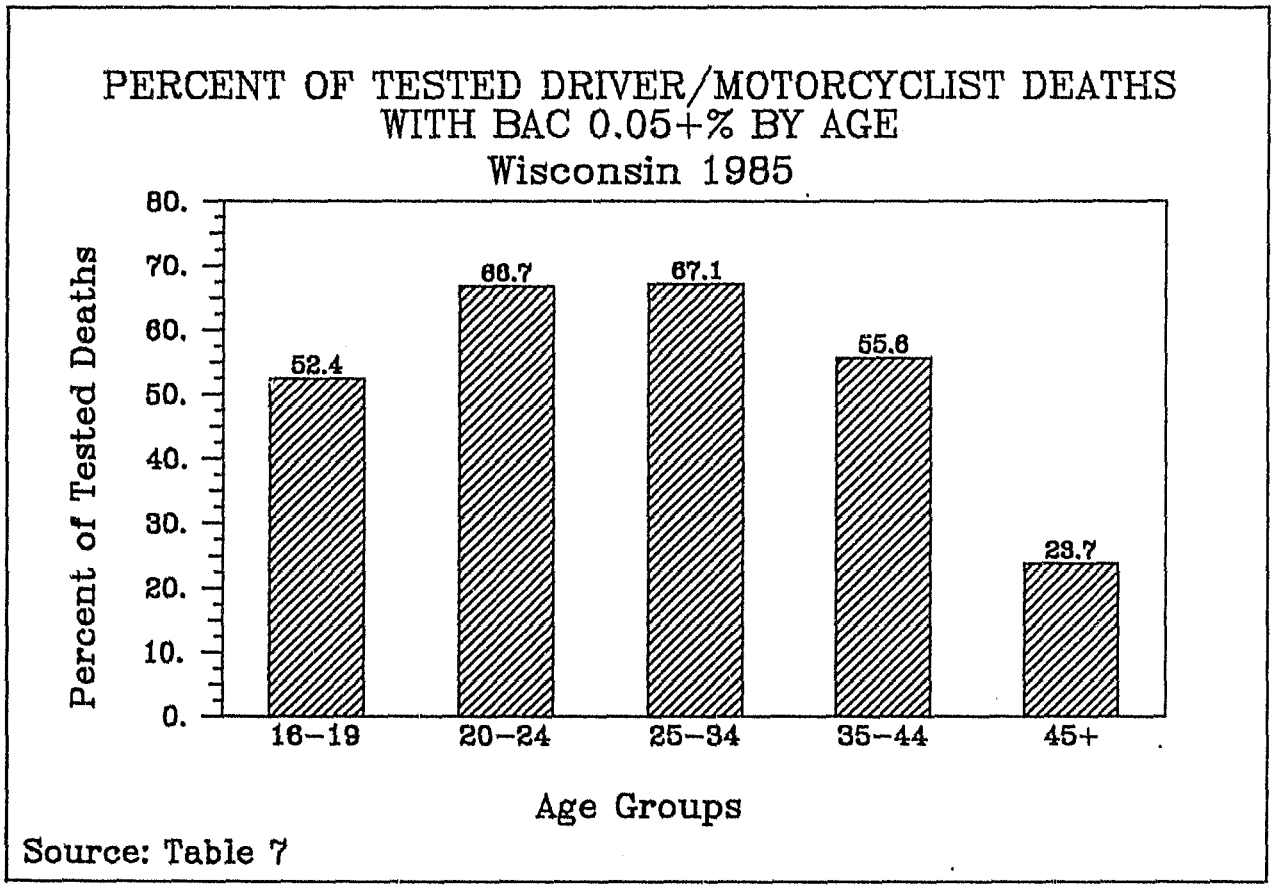
Examination of the graph below showing eighteen years of data reveals no apparent trend over time in the proportion of driver/motorcyclist deaths with BAC exceeding 0.05%. Although the proportion of tested deaths involving alcohol has varied from year to year over the eighteen year period, it has remained relatively close to the eighteen year average of 57.0 percent.



Source: Table 6

Age and Sex

Fifty-one percent of all the driver/motorcyclist deaths tested in 1985 had significant BAC levels (0.05+%). The proportion was comparably high for age groups 20-24 (66.7) and 25-34 (67.1). The under twenty and 35-44 drivers had intermediate rates, while the rate was significantly lower for age group 45 and older. When age groups are collapsed into under 35 and 35 and older, the former has a significantly higher proportion than the latter.



Source: Table 7

An earlier study* found that the degree of alcohol involvement among teenage driver fatalities aged 16-19 was greater than those aged 20-44. However, for the years 1975 through 1977 these two age groups did not differ significantly in proportion of fatalities with significant BAC levels, and in 1979 as in 1978 the 16-19 age group actually has a significantly lower ($p. < .05$) proportion of alcohol involvement (62.6 percent) than the 20-44 age group (73.8 percent). In 1980, the two age groups returned to parity.

* E.M. Naor and R.D. Nashold Teenage driver fatalities following reduction in the legal drinking age, Journal of Safety Research, 7 (2), June 1975.

Table 7

DRIVER DEATHS a/
BY BLOOD ALCOHOL CONCENTRATION (BAC), AGE AND SEX
Wisconsin, 1985

Age	Total			Males			Females		
	Total* Tested	BAC 0.05+%	BAC 0.10+%	Total* Tested	BAC 0.05+%	BAC 0.10+%	Total* Tested	BAC 0.05+%	BAC 0.10+%
All Ages	344	176	152	255	150	130	89	26	22
16	7	4	4	4	2	2	3	2	2
17	8	5	5	7	4	4	1	1	1
18	12	3	3	7	3	3	5		
19	15	10	9	14	9	8	1	1	1
16-19	42	22	21	32	18	17	10	4	4
20	14	12	11	12	11	10	2	1	1
21	14	8	7	11	7	6	3	1	1
22	17	12	11	11	8	8	6	4	3
23	18	11	9	15	11	9	3		
24	15	9	7	11	9	7	4		
20-24	78	52	45	60	46	40	18	6	5
25-29	42	27	22	32	20	16	10	7	6
30-34	31	22	19	24	19	17	7	3	2
35-39	28	16	15	21	15	14	7	1	1
40-44	26	14	13	18	13	12	8	1	1
45-49	12	4	4	8	4	4	4		
50-54	14	6	5	10	5	4	4	1	1
55-59	19	7	4	12	5	3	7	2	1
60-64	16	3	3	12	3	3	4		
65-69	13	2	1	12	1		1	1	1
70-74	8			5			3		
75+	15	1		9	1		6		

* Decedents with BAC less than 0.05% included in total only.
a/ Includes motorcyclists.

Relation to Numbers of Licensed Drivers by Age

The rate per 100,000 licensed drivers must be interpreted with caution. In actuality, traffic mortality may be related to the amount of driving, or mileage, rather than to the number of drivers. Mileage information by age group is not available, however. Since the yearly mileage travelled per person is without doubt dependent on age, the relationship between the fatality rate based on mileage, could it be calculated, and the rate per 100,000 drivers would be different for each age-sex group.

Furthermore, the age-specific rates (per 100,000 drivers) of deaths with BAC levels of 0.05+% are dependent on the rates of deaths tested and the proportions of tested deaths with BAC levels of 0.05+%. Rates per 100,000 drivers while intuitively appealing do not add any additional information and are difficult to interpret.

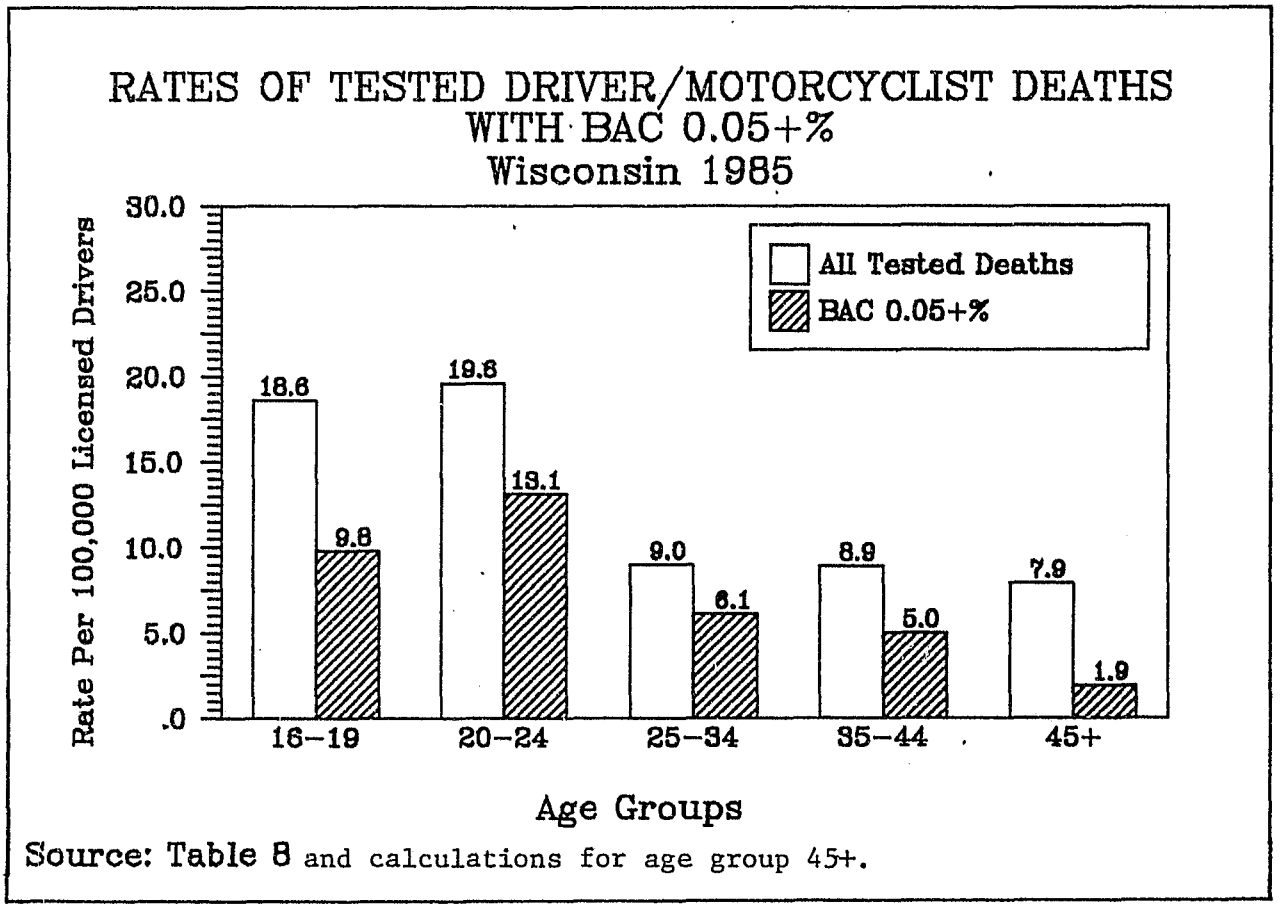
Analyses by age were based on the combined rates for males and females since there were too few female decedents to permit calculation of reliable rates and percentages. However, the proportion of females among tested deaths is uniformly low at all ages. Differential patterns of alcohol involvement by age for males and females would not, therefore, have a substantial effect on the combined distribution.

Table 8

RATES OF DRIVER DEATHS a/ PER 100,000 LICENSED DRIVERS b/
WITH BLOOD ALCOHOL CONCENTRATION (BAC) 0.05+% AND 0.10+%
BY AGE AND SEX c/
Wisconsin, 1985

	Rates of All Tested Deaths			Rates of Tested Deaths with BAC 0.05+%			Rates of Tested Deaths with BAC 0.10+%		
Age Groups	Total	Male	Female	Total	Male	Female	Total	Male	Female
All Ages	10.5	15.0	5.7	5.4	8.8	1.7	4.7	7.7	1.4
16-19	18.6	27.0		9.8			9.3		
20-24	19.6	29.1		13.1	22.3		11.3	19.4	
25-34	9.0	13.5		6.1	9.4		5.1	8.0	
35-44	8.9	12.6		5.0	9.1		4.6	8.4	
45-54	6.3								
55-64	9.0	11.8							
65+	8.4	11.2							

Rates based on fewer than 20 cases are omitted because they are subject to large random fluctuations.
a/ Includes motorcyclists
b/ See Appendix
c/ Source: Table 7



Source: Table 8 and calculations for age group 45+.

Intersections and Road Class

Eighty-three percent of tested driver/motorcyclist deaths occurred at roadway areas other than intersections. In 1985 the proportion of tested driver/motorcyclist deaths with BAC levels of 0.05% or higher was not significantly higher in fatalities occurring at non-intersections (53.8 percent) than in fatalities at intersections (37.9 percent).

In 1985 BAC levels among tested driver/motorcyclist fatalities did not differ greatly by road class. The highest proportion of BAC levels of 0.05% or higher occurred on city and village streets (63.9 percent), followed by county and town roads (58.5 percent) and highways (44.2 percent). The relationship between BAC levels and road class has been inconsistent in recent years. When the county, town, village and city street data are combined and compared with the combined highway data, the former rate (60 percent) is significantly higher than the latter (44 percent).

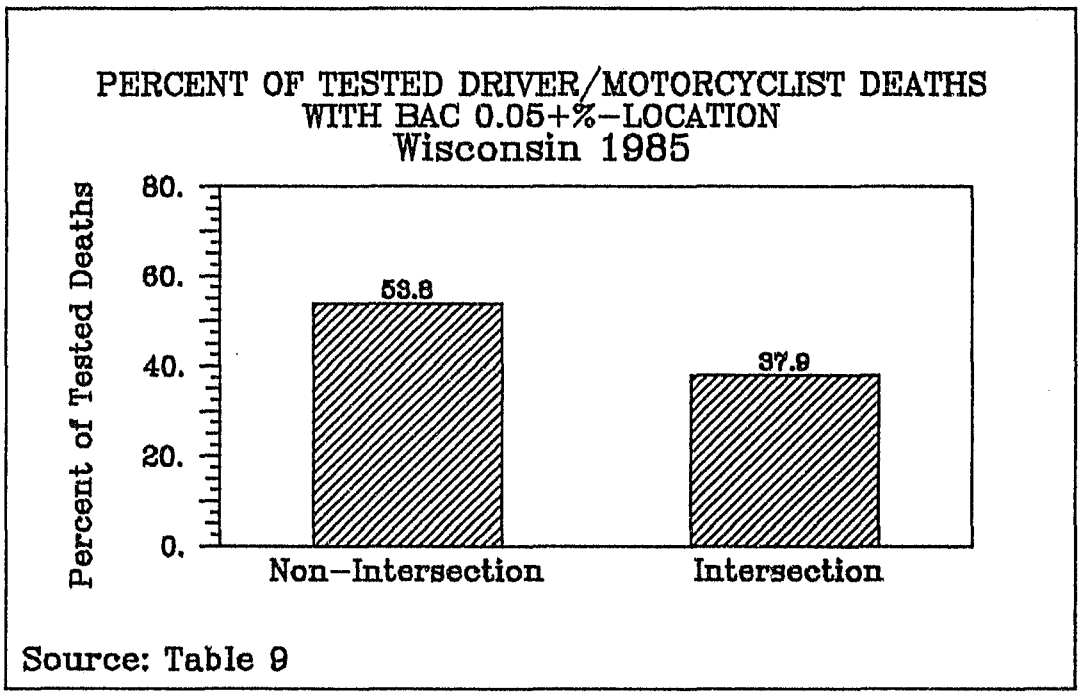
No data are readily available to relate BAC levels to vehicular use, type of accident (single or multi-car), or person-miles travelled on specific types of roadways.

Table 9

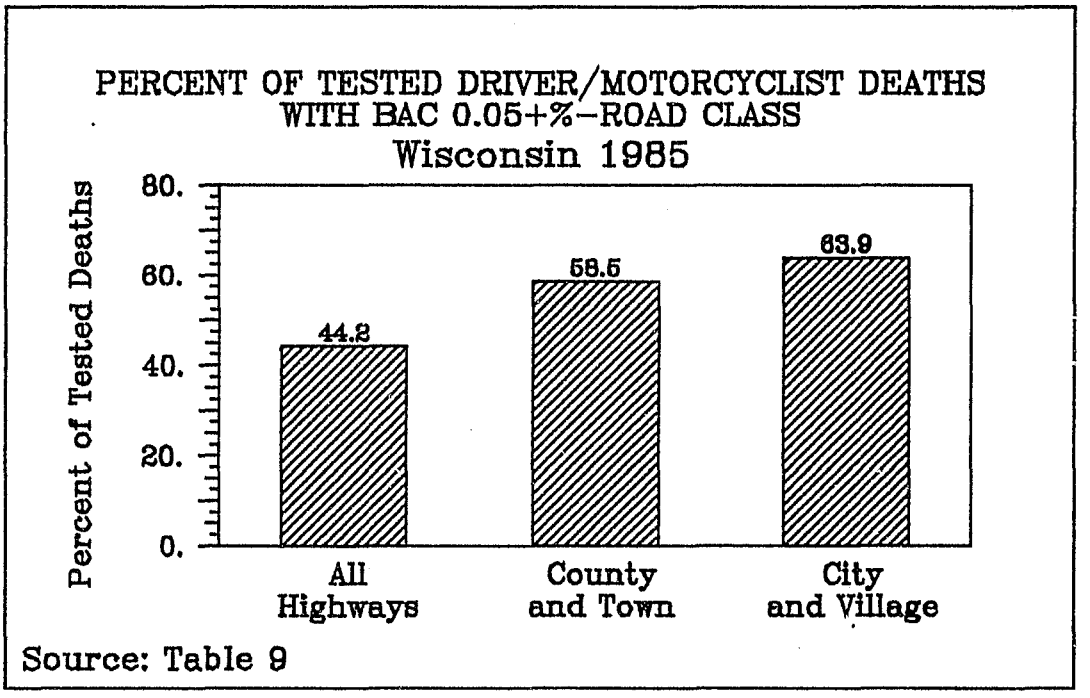
DRIVER DEATHS a/ AT INTERSECTIONS
BY BLOOD ALCOHOL CONCENTRATION (BAC) AND ROAD CLASS
Wisconsin, 1985

Road Class	Total			Non-Intersection			Intersection		
	Total* Tested	BAC 0.05+%	BAC 0.10+%	Total* Tested	BAC 0.05+%	BAC 0.10+%	Total* Tested	BAC 0.05+%	BAC 0.10+%
All Classes	344	176	152	286	154	138	58	22	14
Interstate	13	4	3	11	3	3	2	1	
U.S. Highways	60	22	17	49	20	15	11	2	2
State Highways	108	54	47	95	46	43	13	8	4
County Trunk & Town Roads	123	72	66	102	65	61	21	7	5
City & Village Streets	36	23	18	25	19	15	11	4	3
Unknown & Others	4	1	1	4	1	1			

* Decedents with BAC less than 0.05% included in total only.
a/ Includes motorcyclists.



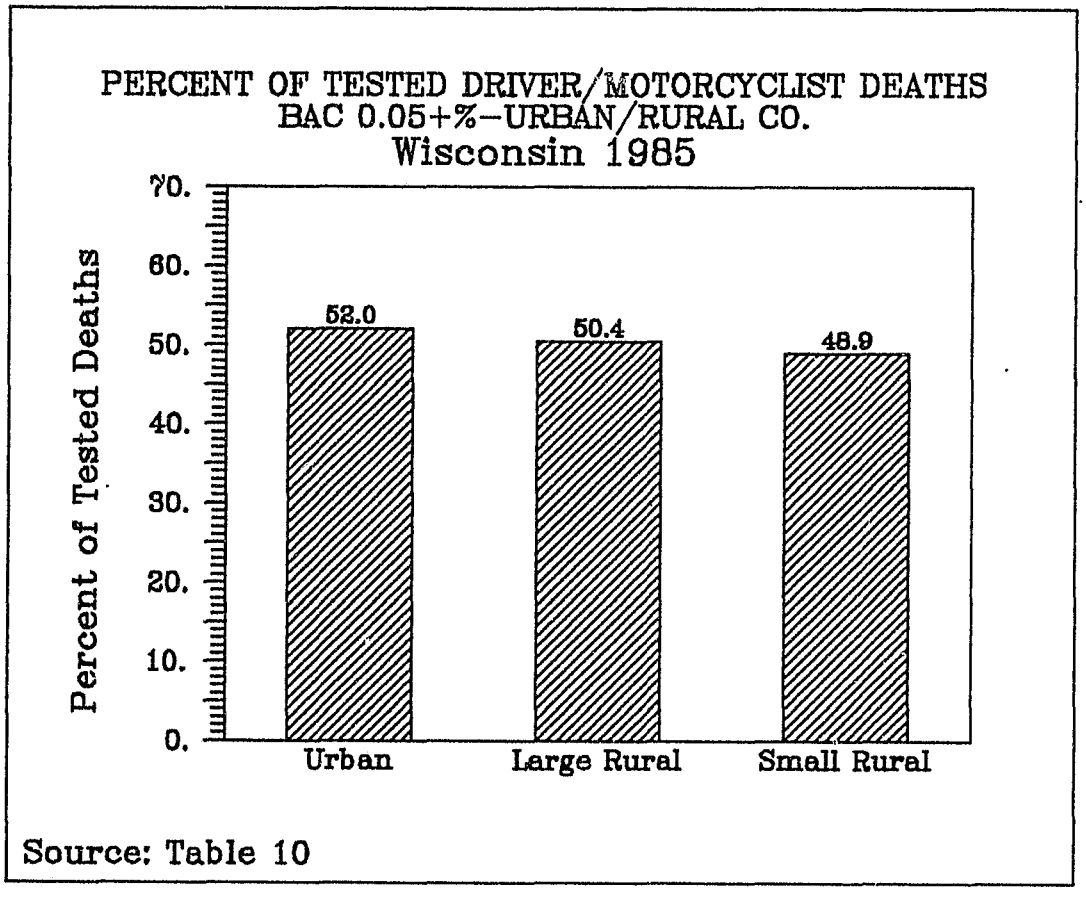
Source: Table 9



Source: Table 9

Urban/Rural

In the last five years BAC levels have not shown a significant or consistent pattern with respect to urban/rural classification of the accident place. Significant BAC levels were found in 48.9 percent of the deaths in the 23 counties of less than 20,000 population ("small" rural counties), and 52.0 percent had BAC levels of 0.05% or higher of the deaths occurring in the 21 counties that were either included in Metropolitan Statistical Areas in 1985 or contained a city of 25,000 or more (urban counties). In rural counties with 20,000 or more population ("large" rural counties), 50.4 percent of the tested fatalities had BAC levels of 0.05% or higher.



Source: Table 10

Table 10

DRIVER DEATHS a/ BY BLOOD ALCOHOL CONCENTRATION (BAC)
FOR URBAN AND RURAL COUNTIES
Wisconsin, 1985

(Occurrence data)

County Groups	Total Deaths Tested*	BAC 0.05+%	BAC 0.10+%
State Total	343	175	151
Urban b/	177	92	74
"Large" Rural c/	119	60	55
"Small" Rural d/	47	23	22

* Decedents with BAC less than 0.05% included in total only.
a/ Includes motorcyclists.
b/ Includes counties that are in Metropolitan Statistical Areas or contain a city of 25,000 or more in 1985.
c/ Includes remaining counties with 20,000 or more population in 1985.
d/ Includes remaining counties with less than 20,000 population in 1985.

(See Appendix)

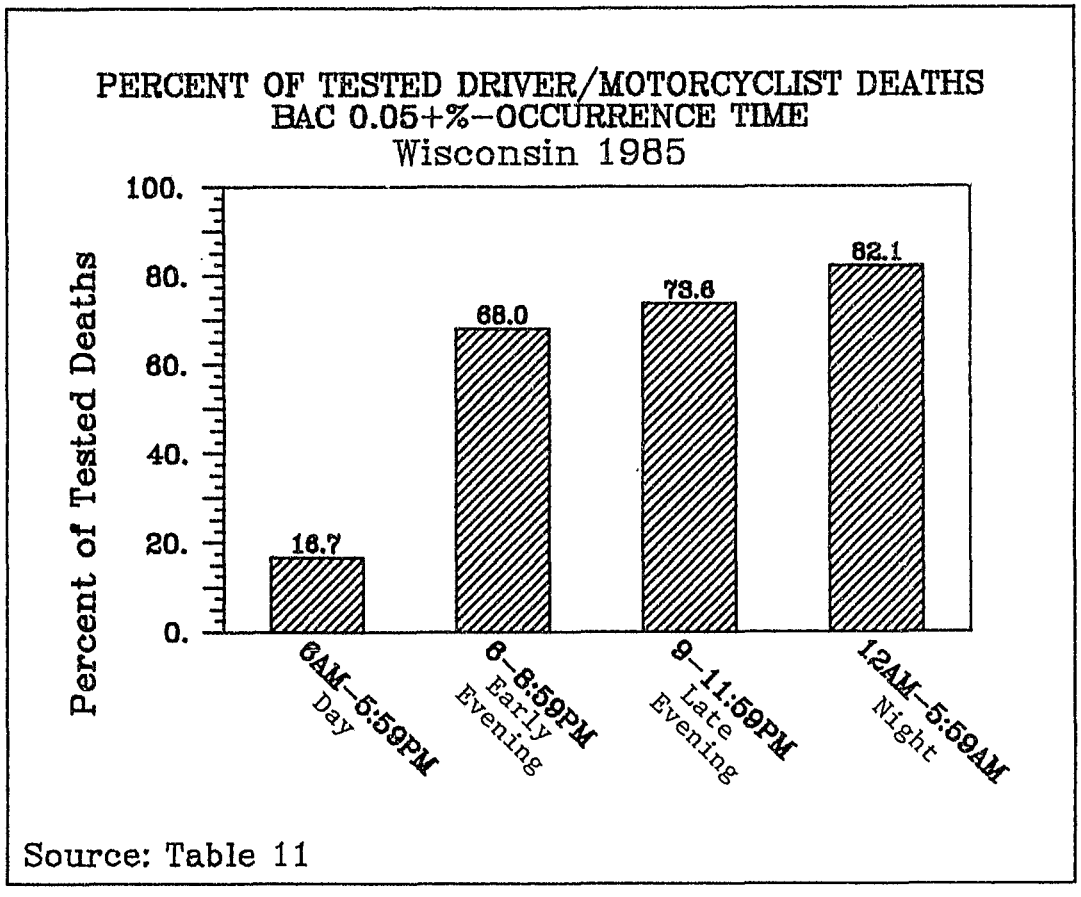
Seventy percent of the tested deaths (124 of 177) in urban counties occurred in rural areas of these counties. The proportion with alcohol involvement among these (60 of 124 deaths, or 48.4 percent) was not significantly different from those deaths which occurred in the urban areas of the counties (32 of 53 or 60.4 percent).

Detailed study of rural accidents in relation to predominant road type, road construction, location of taverns, geographic patterns of drinking behavior, place of residence and place of occurrence would be required to further elucidate the relationship of alcohol involvement and urbanization.

Time of Accident

Over one-third (198 of 344) of the driver/motorcyclist fatalities tested occurred in the evening or at night, between 6 P.M. and 5:59 A.M. Comparison of deaths occurring during the day and at night shows that a significantly larger proportion ($p < .001$) of nighttime accidents (76.3 percent) than daytime accidents (16.7 percent) involved alcohol. Alcohol involvement in the early evening (68.0 percent) is exceeded by that in the late evening (73.6 percent) although not significantly. However, the night hours, consistent with previous years, have by far the highest alcohol involvement (82.1 percent).

With the minor exception of 1979 a consistent pattern is evident since 1973. Although the level of alcohol involvement in the various time periods may vary from year to year, most notably the day and early evening hours, the same increasing progression of alcohol involvement from the day to the night hours is seen.



Source: Table 11

Table 11

DRIVER DEATHS a/ BY BLOOD ALCOHOL CONCENTRATION (BAC)
AND TIME OF ACCIDENT
Wisconsin, 1985

Time of Accident		Total Deaths Tested*	BAC 0.05+%	BAC 0.10+%
Total		344	176	152
Early Morning	6 - 8:59 A.M.	15	1	1
Late Morning	9 - 11:59 A.M.	37	4	4
Early Afternoon	Noon - 2:59 P.M.	40	7	6
Late Afternoon	3 - 5:59 P.M.	52	12	11
Day	6 A.M. - 5:59 P.M.	144	24	22
Early Evening	6 - 8:59 P.M.	50	34	24
Late Evening	9 - 11:59 P.M.	53	39	34
Night	Midnight - 5:59 A.M.	95	78	72
	12 - 12:59 A.M.	*23*	*17*	*15*
	1 - 1:59 A.M.	*28*	*23*	*21*
	2 - 2:59 A.M.	*25*	*23*	*23*
	3 - 5:59 A.M.	*19*	*15*	*13*
Night	6 P.M. - 5:59 A.M.	198	151	130
Unknown		2	1	

* Decedents with BAC less than 0.05% included in total only.
a/ Includes motorcyclists.

The pattern of alcohol involvement in the midnight to 3 A.M. period has been variable over the years. In 1985 the proportion of deaths with alcohol involvement was consistently high from 1 A.M. to 3 A.M. (82.1 and 92.0 percent) with (78.9 percent) in the predawn hours. However these differences were not statistically significant.

Detailed tabulations of BAC levels by time of accident and age of the decedent are available on request; however, the numbers become very small when cross-classified by time and age. There appears to be little difference in the patterns of associations among persons of different age groups.

Day of Week

The time of day has a strong influence on both the number of fatalities and the proportion with alcohol involvement. Weekdays (6 A.M. Monday to 6 P.M. Friday, 108 hours) claimed 208 tested fatalities; 84 or 40.4 percent of these fatalities had a BAC of 0.05% or more. Weekends (6 P.M. Friday to 6 A.M. Monday, 60 hours) claimed 111 fatalities, 74 or 66.7 percent had a significant BAC level.

Table 12

DRIVER DEATHS a/ BY BLOOD ALCOHOL CONCENTRATION (BAC) AND DAY OF WEEK ACCIDENT OCCURRED
Wisconsin, 1985

Day of Week	Total Deaths Tested*	BAC 0.05+%	BAC 0.10+%
Total	344	176	152
Monday	49	16	12
Tuesday	39	14	10
Wednesday	39	16	13
Thursday	55	25	22
Friday	41	24	23
Saturday	68	46	39
Sunday	53	35	33
Monday-Friday	223	95	80
Saturday-Sunday	121	81	72

* Decedents with BAC less than 0.05% are included in total only.
a/ Includes motorcyclists.

Seasonality and Holiday Periods

The proportion of tested driver/motorcyclist fatalities with alcohol involvement fluctuated by month. The highest number of tested fatalities with alcohol involvement (BAC levels 0.05+%) was August with 30, the three lowest were February with seven, January with eight, and December with nine. The highest percentage involvement was March (80.0), and lowest January (30.8). No statistically significant monthly influences are to be found.

Table 13

DRIVER DEATHS a/ BY BLOOD ALCOHOL CONCENTRATION (BAC) AND MONTH OF ACCIDENT
Wisconsin, 1985

Month of Accident	Total Tested*	BAC 0.05+%	BAC 0.10+%	Percent of Tested Deaths BAC 0.05+%	Percent of Tested Deaths BAC 0.10+%
Total	344	176	152	51.2	44.2
January	26	8	6	30.8	23.1
February	19	7	5	36.8	26.3
March	15	12	11	80.0	73.3
April	26	13	10	50.0	38.5
May	29	17	16	58.6	55.2
June	26	15	13	57.7	50.0
July	33	17	17	51.5	51.5
August	54	30	26	55.6	48.1
September	26	10	9	38.5	34.6
October	40	24	20	60.0	50.0
November	35	14	12	40.0	34.3
December	15	9	7	60.0	46.7

* Decedents with BAC less than 0.05% are included in total only.
a/ Includes Motorcyclists.

Alcohol involvement during the holiday periods of 1985 was analyzed using dates as consistent as possible with those of the National Safety Council. As in recent years, the proportion of tested driver/motorcyclist fatalities with BAC levels of 0.05% or higher for accidents occurring during holiday periods (21 out of 38, or 55.3 percent) was not significantly higher than during the rest of the year (155 out of 306, or 50.7 percent). Neither the weekend component nor the weekday part of the holiday periods were significantly higher (or lower) then their non-holiday counterparts.

Table 14

DRIVER DEATHS a/ BY (BAC) 0.05+%
AND PERCENT WITH (BAC)
WEEKEND vs WEEKDAY
HOLIDAY vs NON-HOLIDAY
Wisconsin, 1985

Time Period	Weekend			Weekday		
	Total Tested*	BAC 0.05+%	Percent with BAC	Total Tested*	BAC 0.05+%	Percent with BAC
Holiday	15	8	53.3	23	13	56.5
Non-Holiday	106	73	68.9	200	82	41.0

* Decedents with BAC less than 0.05% are included in total only.
a/ Includes motorcyclists.

MOTORCYCLIST DEATHS

Intersection and Road Class

In 1985 the number of motorcyclist fatalities resumed a decline begun in 1978 which was only interrupted by a rise in 1982. The proportion of tested motorcyclist fatalities with BAC levels of 0.05% or higher decreased in 1985 (71.4), but not significantly so.

BAC levels of 0.05+% were found for 26 of 33 (78.8 percent) non-intersection and 4 of 9 (44.4 percent) intersection fatalities a difference which is not statistically significant. There was a slightly higher incidence of alcohol involvement among motorcyclist fatalities occurring on highways (6 of 8, 75.0 percent) compared to the other road classes (24 of 34, 70.6 percent) but this difference is not statistically significant.

Table 15

MOTORCYCLIST DEATHS
BY BLOOD ALCOHOL CONCENTRATION (BAC) AND ROAD CLASS
Wisconsin, 1985

Road Class	Total Deaths Tested*	BAC 0.05+%	BAC 0.10+%
All Motorcyclists	42	30	26
Interstate	1	1	
U.S. Highways	2	2	2
State Highways	5	3	2
County Trunk and Town Road	22	16	15
City and Village Streets	12	8	7

* Decedents with BAC less than 0.05% included in total only.

Urban/Rural

There was no significant differences apparent in the proportion of tested motorcyclist fatalities with BACs of 0.05% or higher occurring in urban counties (20 out of 29 deaths), in "larger" rural counties (8 out of 10 deaths) and in "small" rural counties (2 out of 3 deaths) or between urban (10 out of 14 deaths) and rural (20 out of 28 deaths) areas within counties. However, the numbers are quite small.

Time and Day of Week

The majority of the tested motorcyclist fatalities (81.0 percent) occurred between 6 P.M. and 6 A.M. In addition alcohol involvement was higher during this period (28 out of 34 deaths) compared to the daylight hours (2 out of 7 deaths), a statistically significant difference. Weekends had a higher incidence of alcohol involvement compared to weekdays (76.2 percent vs. 66.7 percent), a difference which is not statistically significant.

Table 16

MOTORCYCLIST DEATHS BY BLOOD ALCOHOL CONCENTRATION (BAC)
DAY OF WEEK AND TIME OF ACCIDENT
Wisconsin, 1985

Time and Day	Total Deaths Tested*	BAC 0.05+%	BAC 0.10+%
Total	42	30	26
6 A.M. - Noon	1		
Noon - 6 P.M.	6	2	2
6 P.M. - Midnight	17	15	11
Midnight - 6 A.M.	17	13	13
Unknown	1		
Monday - Friday	21	14	11
Saturday - Sunday	21	16	15

* Decedents with BAC less than 0.05% included in total only.

PEDESTRIAN DEATHS

Intersection and Road Class

Of the tested pedestrian fatalities 41.9 percent, had BAC levels of 0.05% or higher. Alcohol involvement was higher for fatalities on highways and county roads (45.5 percent) than on city and village streets (37.5 percent), not a statistically significant difference. In rural areas the proportion of fatalities with significant BAC levels (0.05+%) was not significantly higher than in urban areas. Most (26 out of 31, or 83.9 percent) pedestrian fatalities occurred at roadway areas other than intersections. Of these 42.3 percent had significant BAC levels.

Table 17

PEDESTRIAN DEATHS
BY BLOOD ALCOHOL CONCENTRATION (BAC) AND ROAD CLASS
Wisconsin, 1985

Road Class	Total Deaths Tested	BAC 0.05+%	BAC 0.10+%
All Pedestrians	31	13	13
Interstate	2		
U.S. Highways	5	3	3
State Highways	13	7	7
County Trunk and Town Roads	2		
All Highways, County Trunk and Town Roads	22	10	10
City and Village St.	8	3	3
Unknown	1		

* Decedents with BAC less than 0.05% included in total only.

Time and Day of Week

As in the case of drivers, the pedestrian alcohol involvement was highest between 6 P.M. and 6 A.M., when 58.1 percent of the fatalities tested occurred. The night hours had an incidence of alcohol involvement of 66.7 percent (12 out of 18), a statistically significant difference from the daytime hours incidence of 7.7 percent (1 out of 13). Alcohol involvement was not significantly more frequent among fatalities occurring on the weekends (5 out of 9, 55.6 percent) than among weekday fatalities (8 out of 22, 36.4 percent).

Table 18

PEDESTRIAN DEATHS BY BLOOD ALCOHOL CONCENTRATION (BAC), DAY OF WEEK AND TIME OF ACCIDENT
Wisconsin, 1985

Time and Day	Total Deaths Tested*	BAC 0.05+%	BAC 0.10+%
Total	31	13	13
6 A.M. - Noon	4		
Noon - 6 P.M.	9	1	1
6 P.M. - Midnight	10	4	4
Midnight - 6 A.M.	8	8	8
Monday - Friday	22	8	8
Saturday - Sunday	9	5	5

* Decedents with BAC less than 0.05% included in total only.

APPENDIX

LICENSED DRIVERS BY AGE AND SEX
Wisconsin, 1985

Age Groups	Total	Percent*	Male	Female
All Ages	3,265,322	68.4	1,695,711	1,569,611
16-19	225,420	73.6	118,399	107,021
20-24	398,129	89.4	205,857	192,272
25-34	808,047	98.1	414,898	393,149
35-44	604,230	99.7	309,045	295,185
45-54	409,877	94.5	210,639	199,238
55-64	390,149	90.3	203,755	186,394
65+	429,470	71.4	233,118	196,352

*Percent per estimated population - July 1, 1985 in each age group.

Source: Wisconsin Department of Transportation, Division of Motor Vehicles, Drivers License Statistics: Licensed Drivers (including motorcyclists) as of 12-31-85.

URBAN AND RURAL CLASSIFICATION OF COUNTIES
Wisconsin, 1985

Urban Counties

Includes counties that are Metropolitan Statistical Areas (MSA) or that contain a city of 25,000 or more in 1985. (Twenty-one counties with a total population of 3,347,924; 70.1% of total.)

Brown	Kenosha	Racine
Calumet	La Crosse	Rock
Chippewa	Manitowoc	St. Croix
Dane	Marathon	Sheboygan
Douglas	Milwaukee	Washington
Eau Claire	Outagamie	Waukesha
Fond du Lac	Ozaukee	Winnebago

"Large" Rural Counties

Includes remaining counties with 20,000 or more population in 1985. (Twenty-eight counties with a total population of 1,110,333; 23.2% of total.)

Barron	Juneau	Portage
Clark	Kewaunee	Sauk
Columbia	Langlade	Shawano
Dodge	Lincoln	Trempealeau
Door	Marinette	Vernon
Dunn	Monroe	Walworth
Grant	Oconto	Waupaca
Green	Oneida	Wood
Iowa	Pierce	
Jefferson	Polk	

"Small" Rural Counties

Includes remaining counties with less than 20,000 population in 1985. (Twenty-three counties with a total population of 320,764; 6.7% of total.)

Adams	Green Lake	Richland
Ashland	Iron	Rusk
Bayfield	Jackson	Sawyer
Buffalo	Lafayette	Taylor
Burnett	Marquette	Vilas
Crawford	Menominee	Washburn
Florence	Pepin	Waushara
Forest	Price	

Source: Wisconsin Dept. of Administration, Demographic Services Center, Official Population Estimates for 1985 as of January 1, 1985.