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Alcohol Involvement in Fatal Crashes 1999

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Executive Summary

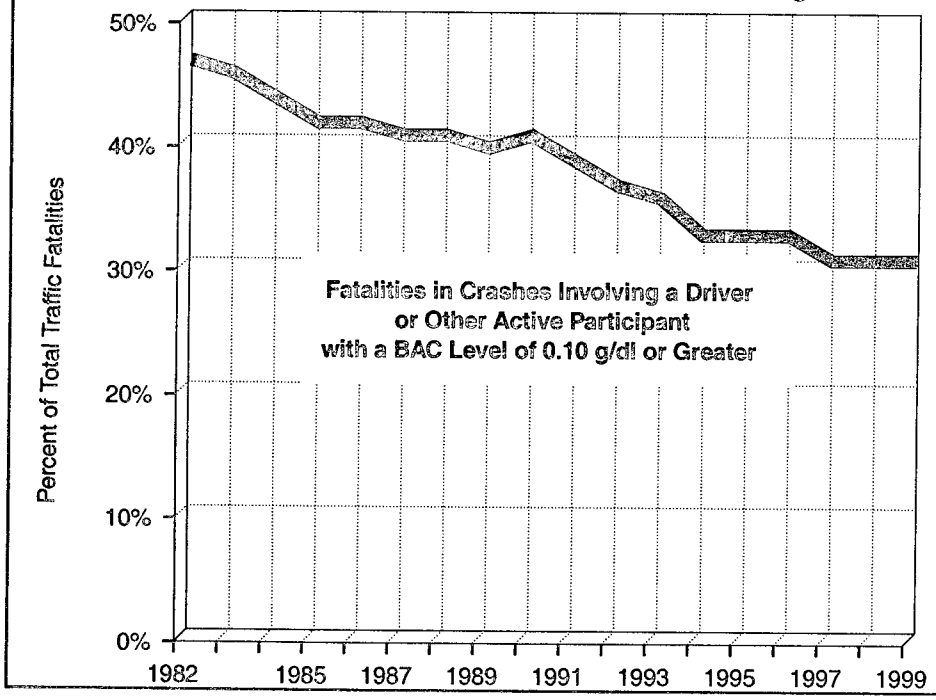
This report presents estimates of alcohol involvement in fatal traffic crashes that occurred during 1999. Several comparisons of alcohol involvement for the period 1982-1999 are presented to illustrate changes and trends. The data are abstracted from the Fatality Analysis Reporting System (FARS) and represent a combination of actual blood alcohol concentration (BAC) test results and estimated BAC distributions for those drivers and nonoccupants for whom no BAC test results are available. The estimates are made using a model developed by the National Highway Traffic Safety Administration.

In 1999, 30 percent of all traffic fatalities involved at least one driver or nonoccupant with BAC of 0.10 or greater (in this report, a BAC of 0.10 or greater is synonymous with intoxication). This represents a reduction of 35 percent from 1982, when 46 percent of all fatalities occurred in crashes that involved an intoxicated active participant. Occupant fatalities resulting from crashes involving an intoxicated driver or nonoccupant totaled 10,155 in 1999. Less than one-half (39 percent) of the fatalities in single-vehicle crashes involved an intoxicated driver or nonoccupant, compared with 19 percent of the fatalities in multi-vehicle crashes. An estimated 38 percent of the fatalities in nonoccupant crashes involved an intoxicated driver or nonoccupant.

Almost two-thirds (63 percent) of the fatally injured drivers in single-vehicle fatal crashes on weekend nights were drunk. Overall, male drivers involved in fatal crashes were twice as likely as female drivers to be drunk (20 percent and 10 percent, respectively). Drivers between 21 and 24 years old had the highest rates of intoxication (27 percent), followed by those between 25 and 29 years old (24 percent). Drivers 16 to 20 years old involved in fatal crashes were intoxicated 14 percent of the time.

Between 1982 and 1999, estimated reductions in the proportion of intoxicated drivers in fatal crashes are 45 percent for drivers of passenger cars, 43 percent

Figure ES1. Trend in Fatalities from Crashes Involving an Intoxicated Participant, 1982-1999



The overall trend in fatalities from crashes involving an intoxicated participant reflects a general decline from 46 percent in 1982 to 30 percent in 1999.

for light trucks and vans, 60 percent for medium trucks, 75 percent for heavy trucks, and 32 percent for motorcycles. Drivers of motorcycles continue to exhibit a high rate of intoxication in fatal crashes, with 28 percent having levels of at least 0.10 in 1999, compared with 20 percent for drivers of light trucks and vans and 17 percent for drivers of passenger cars.

The following comparisons can be made for the 1998 and 1999 data:

- In 1999, 30 percent of all fatal crashes involved a driver or nonoccupant with BAC 0.10 or greater, the same as in 1998.
- Alcohol involvement rates (BAC 0.01 or greater) were unchanged for female drivers in fatal crashes (14 percent in both 1998 and 1999) and slightly lower for male drivers in fatal crashes (27 percent in 1998 and 26 percent in 1999). Female drivers in fatal crashes continue to have much lower rates of alcohol involvement than males (48 percent lower in 1998 and 46 percent lower in 1999).

1. Introduction

It is a well-established fact that drunk driving plays a major role in fatal crashes. Research has demonstrated that alcohol in a driver's bloodstream greatly impairs the driver's ability to operate a vehicle safely.

This report presents data obtained from the Fatality Analysis Reporting System (FARS) and analyzed using a procedure to estimate blood alcohol content (BAC) levels for drivers and nonoccupants involved in fatal crashes. The report describes the magnitude of the drunk driving problem in the United States, highlights the circumstances under which fatal crashes are frequently associated with alcohol, and shows recent trends in alcohol involvement in fatal crashes.

Data

FARS contains data on all fatal traffic crashes from each of the states. The data include the results of chemical blood alcohol tests of drivers involved in fatal crashes when they are available. BAC tests form the basis for the statistics reported here; however, for a variety of technical, practical, and economic reasons, no state reports BAC values for all the drivers and nonoccupants involved in fatal crashes. The missing data rate ranges from a few percent in some states to nearly complete absence of testing in others.

Although the nationwide BAC reporting rate has risen over the past 17 years from about 54 percent for fatally injured drivers and 16 percent for surviving drivers to 62 percent and 25 percent, respectively, there are still too many unknown BAC values to ignore. Alcohol involvement for drivers with unknown BAC values must therefore be estimated before valid statistics on the role of alcohol in fatal crashes can be determined. The same is true for nonoccupants.

Estimation

Several methods have been used in the past to estimate BAC values for drivers who were not tested. Each method has substantial limitations. To overcome many of the limitations and, in particular, to estimate BAC values for surviving drivers, the National Center for Statistics and Analysis (NCSA) has developed a method based on discriminant analysis to estimate BAC values for all drivers involved in fatal crashes. The method is documented completely in a 1986 report from the National Highway Traffic Safety Administration (NHTSA).[1]

Briefly, the method estimates unknown BACs from the known BAC data for drivers with similar characteristics (such as sex, time of the crash, police alcohol indication, and vehicle type). This method was used to produce all the statistics in this report.

Presentation

BAC test results range from 0.00 grams per deciliter (g/dl) to more than 0.30. The numbers represent the amount of alcohol, by weight (grams), per amount of blood, by volume (deciliters). In practice, BAC test results measure the percentage of alcohol contained in the blood. For the purposes of this report, it is impractical to treat BAC as a continuous variable. Instead, BAC values are classified into three groups that tell the story of drunk driving in a concise and directly accessible way:

- the 0.00 group of drivers (sober drivers), whose blood contains no alcohol

[1]Klein, T.M., *A Method for Estimating Posterior BAC Distributions for Persons Involved in Fatal Accidents*, DOT HS 807 094 (July 1986).

- the 0.01 to 0.09 group of drivers, whose blood contains some alcohol but less than 0.10 percent (the legal threshold for intoxication in many states)
- the 0.10+ group of drivers (intoxicated or drunk drivers), whose BAC is at or above the usual level of legal intoxication.

Alcohol involvement is shown in the tables of this report by listing either the percentages of drivers in each of the three groups or the percentage of drivers in the high BAC (0.10+) group only, together with the total number of crashes or drivers as appropriate. Because some data are missing or unknown, totals from the disaggregated tables may not add up to the aggregated totals in summary tables. For example, the total of daytime and nighttime crashes is less than the total of all crashes, because the crash times for a few crashes are not known.

Interpretation of Estimates

The procedure used throughout this report produces estimates, not exact counts. The possible error of the estimates is not known precisely, but extensive validation tests suggest that the error of any one estimate is relatively small and, more importantly, does not appreciably affect comparisons such as those in the trends section.

In addition, it is necessary to emphasize that none of the tabulations presented here can be interpreted as implying a direct causal relationship between alcohol use and any other attribute of fatal crashes. Inferences concerning causality can only be made on the basis of additional information that is independent of the FARS data.

Reporting Level

Alcohol involvement in motor vehicle crashes is customarily reported for crashes or for the persons involved in crashes. For persons, the BAC status of each active participant (driver, pedestrian, or pedalcyclist) in the crash is reported individually. For crashes, the entire crash is classified at the highest BAC level of any active participant.

In crashes in which individual BACs are known, the crash is given a count of 1 at the appropriate BAC level. Thus, a 0.00 crash is one in which all drivers and nonoccupants were sober; a 0.01-0.09 crash is one in which at least one driver or nonoccupant had a BAC level between 0.01 and 0.09 but none had a higher BAC level; and a 0.10+ crash is one in which at least one driver or nonoccupant was intoxicated.

For crashes in which not all individual BACs are known, the count of 1 is distributed among the three BAC levels according to the probability distributions for alcohol involvement of each active participant. In crashes with only one active participant, the crash-level BAC distribution will be identical to that of the one participant. Where two or more persons were actively involved, joint probabilities are calculated from the individual BAC probability distributions to arrive at the crash-level BAC distribution.

2. Fatalities

In 1999, 41,611 persons were killed as a result of traffic crashes. Of those fatalities, 30 percent (12,321) occurred in crashes in which a driver or nonoccupant was intoxicated. An additional 8 percent (3,466) involved a driver or nonoccupant who had been drinking but whose BAC was below 0.10. Overall, 38 percent (15,786) of all traffic fatalities involved a driver or nonoccupant with a BAC of 0.01 or above.

Tables 1 and 2 show age distributions for occupant (driver or passenger) and nonoccupant fatalities, respectively. The pattern of occupant fatalities by age group (Table 1) is similar to that for nonoccupant fatalities (Table 2) in crashes involving at least one intoxicated participant.

Overall, the proportion of nonoccupants who died in crashes involving at least one intoxicated participant (38 percent) was greater than that for occupants (28 percent). In addition, the proportion of nonoccupant fatalities in BAC 0.10+ crashes was higher than the proportion for occupant fatalities in all the age groups over 15 years old.

Figures 1 and 2 show age distributions for the percentages of intoxicated drivers and intoxicated nonoccupants in these crashes in 1999. Again, the proportion of intoxicated nonoccupants was higher than the proportion of intoxicated drivers for all age groups over 15 years old. The peak involvement rate in fatal crashes for intoxicated drivers also occurred at an earlier age and dropped more sharply than the involvement rate for intoxicated nonoccupants.

Table 1. Occupant Fatalities by Person Age and Crash BAC, 1999

Person Age (Years)	Percent of Fatalities with Crash BAC			Total Fatalities
	0.00	0.01-0.09	0.10+	
0-15	78	8	14	2,108
16-20	65	11	24	5,567
21-24	46	12	42	3,606
25-29	48	10	42	3,321
30-34	48	9	42	2,788
35-39	49	9	42	2,897
40-44	54	8	38	2,751
45-49	61	9	31	2,249
50-54	68	6	26	1,856
55-64	75	7	19	2,689
65+	88	4	8	5,920
Total	**63**	**8**	**28**	**35,806**

Table 2. Nonoccupant Fatalities by Person Age and Crash BAC, 1999

Person Age (Years)	Percent of Fatalities with Crash BAC			Total Fatalities
	0.00	0.01-0.09	0.10+	
0-15	81	6	13	811
16-20	49	10	40	349
21-24	37	10	53	270
25-29	38	8	54	319
30-34	35	10	55	385
35-39	33	9	58	522
40-44	38	8	54	539
45-49	41	8	51	447
50-54	47	8	44	350
55-64	51	10	39	533
65+	78	7	15	1,159
Total	**54**	**8**	**38**	**5,738**

As shown in Table 3, there were almost as many fatalities in single-vehicle crashes as in multi-vehicle crashes in 1999. However, the frequency of alcohol occurrence in single-vehicle crashes was much higher.

Table 4 shows the BAC distributions for male and female fatalities in 1999. Of the 27,973 male fatalities, 35 percent occurred in BAC 0.10+ crashes, as compared with only 19 percent of the 13,627 female fatalities.

Figure 1. Percentage of Drivers with BAC 0.10+ by Age, 1999

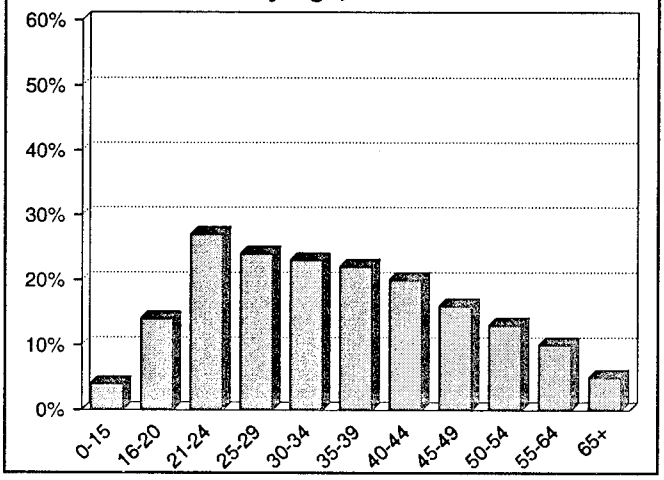


Figure 2. Percentage of Nonoccupants with BAC 0.10+ by Age, 1999

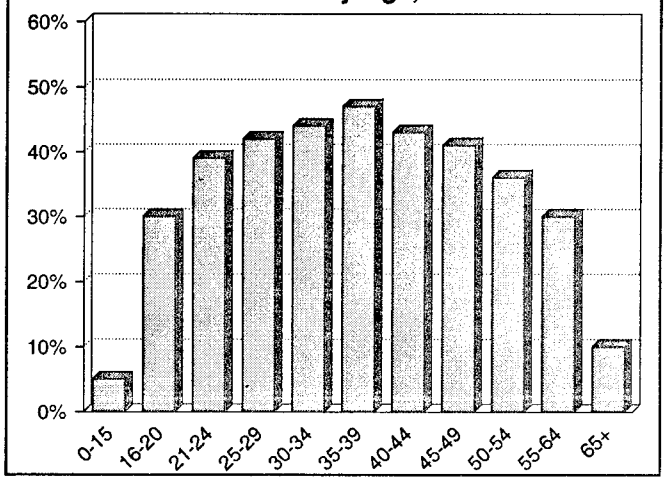


Table 3. Fatalities by Crash Type and BAC, 1999

Crash Type	Percent of Fatalities with Crash BAC 0.00	0.01-0.09	0.10+	Total Fatalities
Single-Vehicle . .	52	9	39	17,092
Multi-Vehicle. . .	73	8	19	18,752
Nonoccupant . .	54	8	38	5,767

Table 4. Fatalities by Sex and BAC, 1999

Sex	Percent of Fatalities with Crash BAC 0.00	0.01-0.09	0.10+	Total Fatalities
Male.	56	9	35	27,973
Female	74	7	19	13,627
Total	62	8	30	41,611

3. Crashes

In 1999, 37,043 traffic crashes resulted in the death of one or more persons. In 30 percent of those crashes, at least one driver or nonoccupant (pedestrian or pedalcyclist) had a BAC at or above the level of intoxication (0.10+), as shown in Table 5.

The development of effective countermeasures depends on the ability of safety experts and government agencies to understand the conditions under which drunk driving is particularly prevalent. To assist in that understanding, the summary data in Table 5 can be disaggregated to reveal relationships between alcohol and other fatal crash attributes. Again, because some data are missing or unknown, totals from the disaggregated tables may not add up to the total number of crashes (37,043) shown in Table 5.

Table 5. Fatal Crash BAC Distribution, 1999

Percent of Crashes with Crash BAC			Total
0.00	0.01-0.09	0.10+	Crashes
62	8	30	37,043

Table 6. Fatal Crash BAC Distribution by Time of Day, 1999

	Percent of Crashes with Crash BAC			Total
Time	0.00	0.01-0.09	0.10+	Crashes
Day*	83	5	11	18,576
Night	40	11	49	18,150

*Day is defined as 6:00 a.m. to 5:59 p.m.

Day and Time

Alcohol is more prevalent in fatal crashes at night than during the day and more prevalent on weekends than on weekdays. Tables 6 and 7 summarize the BAC distributions for fatal crashes by time of day and period of week.

Table 7. Fatal Crash BAC Distribution by Period of Week, 1999

	Percent of Crashes with Crash BAC			Total
Period	0.00	0.01-0.09	0.10+	Crashes
Weekday* . . .	71	7	22	21,606
Weekend . . .	49	10	41	15,359

*Weekday is defined as Monday 6:00 a.m. to Friday 5:59 p.m.

Table 8 classifies fatal crashes simultaneously by time of day and period of week. In 1999, 9 percent of all fatal crashes that occurred during the daytime hours on weekdays involved at least one intoxicated driver or nonoccupant. The percentage was twice as high during the daytime hours on weekends, and on weekend nights more than one-half (53 percent) of all fatal crashes involved one or more intoxicated drivers or nonoccupants.

It is apparent from these tables that drunk driving is far more prevalent during non-working hours than during the business day.

Table 8. Fatal Crash BAC Distribution by Time of Day and Period of Week, 1999

Time and	Percent of Crashes with Crash BAC			Total
Period	0.00	0.01-0.09	0.10+	Crashes
Day				
Weekday. . .	87	5	9	13,302
Weekend. . .	75	7	18	5,273
Night				
Weekday. . .	47	10	43	8,203
Weekend. . .	35	12	53	9,945

Crash Type

Fatal crashes can be classified into three broad types:

- single-vehicle crashes not involving a non-occupant (pedestrian or pedalcyclist)
- multi-vehicle crashes (involving two or more vehicles)
- nonoccupant crashes involving a vehicle and a pedestrian or pedalcyclist (almost always a single vehicle and a single fatally injured nonoccupant).

Table 9 shows the BAC distributions for the three crash types (see "Reporting Level" in Chapter 1 for a discussion of how alcohol-related crashes are counted). Here again, a breakdown by day and time is revealing, as shown in Tables 10 through 12.

Table 9. Fatal Crash BAC Distribution by Crash Type, 1999

Crash Type	Percent of Fatalities with Crash BAC 0.00	0.01-0.09	0.10+	Total Crashes
Single-Vehicle . .	52	9	39	15,657
Multi-Vehicle. . .	74	8	18	15,748
Nonoccupant . .	54	8	38	5,638

Table 10 shows that 58 percent (9,020 out of 15,657, including unknowns) of the single-vehicle crashes in 1999 occurred at night (between 6 p.m. and 5:59 a.m.), when alcohol involvement is relatively high. In contrast, Table 11 indicates that only 35 percent (5,587 out of 15,748) of the multi-vehicle crashes during the year occurred during nighttime hours. The majority of multi-vehicle crashes (64 percent) occurred during the daytime, when alcohol involvement is relatively low.

The higher rate of alcohol involvement in non-occupant crashes (Table 12) compared to multi-vehicle crashes (Table 11) during all time periods warrants a closer look at alcohol involvement for both drivers and nonoccupants. Table 13 shows the BAC distributions for drivers and nonoccupants (most of whom are pedestrians) in nonoccupant fatal crashes. The row and column totals in Table 13 show clearly that nonoccupants were legally intoxicated more frequently (30 percent) than were vehicle drivers (12 percent) in nonoccupant fatal crashes.

Table 10. Fatal Crash BAC Distribution for Single-Vehicle Crashes by Time of Day and Period of Week, 1999

Time and Period	Percent of Crashes with Crash BAC 0.00	0.01-0.09	0.10+	Total Crashes
Day				
Weekday. . .	82	5	13	4,114
Weekend. . .	68	7	25	2,252
Night				
Weekday. . .	40	10	50	3,912
Weekend. . .	31	11	57	5,108

Table 11. Fatal Crash BAC Distribution for Multi-Vehicle Crashes by Time of Day and Period of Week, 1999

Time and Period	Percent of Crashes with Crash BAC 0.00	0.01-0.09	0.10+	Total Crashes
Day				
Weekday. . .	89	5	6	7,563
Weekend. . .	81	7	12	2,582
Night				
Weekday. . .	58	10	31	2,618
Weekend. . .	45	13	41	2,969

Table 12. Fatal Crash BAC Distribution for Nonoccupant Crashes by Time of Day and Period of Week, 1999

Time and Period	Percent of Crashes with Crash BAC 0.00	0.01-0.09	0.10+	Total Crashes
Day				
Weekday. . .	84	5	11	1,625
Weekend. . .	77	7	16	439
Night				
Weekday. . .	45	9	46	1,673
Weekend. . .	31	10	58	1,868

Table 13. Driver and Nonoccupant BAC Distribution for Nonoccupant Crashes by Time of Day and Period of Week, 1999

Nonoccupant BAC	Percent of Crashes with Driver BAC 0.00	0.01-0.09	0.10+	Percent of Total Crashes
0.00	55	3	6	64
0.01-0.09.	4	1	1	6
0.10+.	22	3	5	30
Total	**81**	**6**	**12**	**100**

Crash Environment

A comparison of fatal crash BAC distributions for the three crash types in urban and rural crash locations is shown in Table 14. For single-vehicle and multi-vehicle crashes, alcohol involvement was higher in urban than in rural crashes. For nonoccupant fatal crashes, alcohol involvement was the same in rural and urban crashes.

Alcohol involvement in nonoccupant fatal crashes tends to be higher on roadways with higher speed limits, as shown in Table 15. Roads with posted limits of 65 mph and above, most of which are in rural areas, appear to be an exception. There is no apparent relationship between alcohol involvement and speed limit for either single-vehicle or multi-vehicle crashes (Table 16). Estimates for roads with a posted limit of 60 mph are based on very small samples.

Alcohol involvement in fatal crashes also varies as a function of roadway type. Table 17 shows crash count and BAC 0.10+ percentages for the principal roadway types. The percentage of crashes involving an intoxicated participant varies both as a function of the type of crash and by type of roadway. For example, the highest percentages of single-vehicle fatal crashes in which a participant was intoxicated were on major rural collectors, whereas for multi-vehicle fatal crashes the highest percentage was on Interstates. The highest percentage of BAC 0.10+ nonoccupant fatal crashes was also on Interstates.

Table 14. Fatal Crash BAC Distribution by Crash Type and Land Use, 1999

Crash Type and Land Use	Percent of Crashes with Crash BAC			Total Crashes
	0.00	0.01-0.09	0.10+	
Single-Vehicle				
Urban	50	9	41	4,537
Rural	53	9	39	11,027
Multi-Vehicle				
Urban	72	8	20	6,225
Rural	76	7	17	9,410
Nonoccupant				
Urban	54	8	38	3,826
Rural	54	8	38	1,771

Table 15. Fatal Crash BAC Distribution for Nonoccupant Crashes by Posted Speed Limit, 1999

Speed Limit (Miles per Hour)	Percent of Crashes with Crash BAC			Total Crashes
	0.00	0.01-0.09	0.10+	
25	70	8	22	516
30	63	8	29	680
35	54	9	37	1,002
40	55	7	38	575
45	47	8	46	815
50	47	6	47	259
55	49	9	42	919
60	31	8	61	123
65	43	10	47	312
70	55	11	34	100
75	67	5	28	22

Table 16. Percentage of High BAC (0.10+) Fatal Crashes by Posted Speed Limit and Crash Type, 1999

Speed Limit (Miles per Hour)	Percent of Crashes With BAC 0.10+	
	Single-Vehicle	Multi-Vehicle
25	38	22
30	42	18
35	46	19
40	45	18
45	47	18
50	41	18
55	42	16
60	44	25
65	32	20
70	20	16
75	12	21

Table 17. Percentage of High BAC (0.10+) Fatal Crashes by Roadway Function Class and Crash Type, 1999

	Single-Vehicle		Multi-Vehicle		Nonoccupant	
	Number	Percent	Number	Percent	Number	Percent
Interstate	2,477	24	1,759	20	487	45
Principal Arterial	2,753	36	5,556	18	1,968	42
Minor Arterial	2,239	42	3,304	17	1,087	37
Major Rural Collector	2,688	46	2,096	18	361	40
Local Street/Road	3,898	43	1,906	18	1,290	29

4. Drivers and Nonoccupants

Overview

In 1999, 56,352 drivers were involved in fatal crashes. Of those drivers, 77 percent were sober, 6 percent had BAC levels between 0.01 and 0.09, and 17 percent were intoxicated (BAC 0.10+). Similarly, of the 5,738 fatally injured nonoccupants, 64 percent were sober, 6 percent were in the 0.01 to 0.09 group, and 29 percent were intoxicated.

Table 18 shows that, on average, drivers who survive fatal crashes are intoxicated much less frequently than are fatally injured drivers. Some of the difference may be due to reporting. BAC levels are known more frequently for fatally injured drivers than for survivors. While the alcohol estimation methodology attempts to correct for alcohol underreporting, some bias may still remain.

Table 18. BAC Distributions for Drivers and Nonoccupants in Fatal Crashes, 1999

Person Type	Percent with BAC 0.00	0.01-0.09	0.10+	Total Persons
All Drivers	77	6	17	56,352
Fatally Injured Drivers	66	6	28	25,210
Surviving Drivers	86	5	9	31,142
Fatally Injured Nonoccupants	64	6	29	5,738

Fatally injured drivers show higher alcohol levels than surviving drivers in all crash types and time periods (Tables 19, 20, and 21). In single-vehicle fatal crashes in 1999 (Table 20), the proportion of fatally injured drivers with BAC 0.10+ exceeded the proportion for surviving drivers by 8 to 11 percentage points during the weekday and weekend daytime hours and by 19 to 22 percentage points during the weekday and weekend nighttime periods.

In multi-vehicle fatal crashes (Table 21), fatally injured drivers were at least twice as likely as

Table 19. BAC Distributions for Drivers and Nonoccupants in Fatal Crashes by Crash Type, 1999

Person Type	Percent with BAC 0.00	0.01-0.09	0.10+	Total Persons
Single-Vehicle Crashes				
All Drivers	52	9	39	15,599
Fatally Injured Drivers	50	8	43	12,102
Surviving Drivers	60	13	27	3,497
Multi-Vehicle Crashes				
All Drivers	87	4	9	34,710
Fatally Injured Drivers	81	6	14	13,087
Surviving Drivers	91	4	6	21,623
Nonoccupant Crashes				
All Drivers	82	6	12	6,043
Fatally Injured Drivers	66	12	22	21
Surviving Drivers	82	6	12	6,022
Fatally Injured Nonoccupants	64	6	29	5,738

Table 20. BAC Distributions for Drivers in Single-Vehicle Fatal Crashes by Crash Outcome, Time of Day, and Period of Week, 1999

Time and Period	Percent with BAC 0.00	0.01-0.09	0.10+	Total Drivers
Fatally Injured Drivers				
Day				
Weekday	81	4	15	3,227
Weekend	65	7	28	1,662
Night				
Weekday	38	9	54	3,133
Weekend	28	9	63	3,838
Surviving Drivers				
Day				
Weekday	88	5	7	880
Weekend	76	7	17	583
Night				
Weekday	48	17	35	764
Weekend	41	19	41	1,247

Table 21. BAC Distributions for Drivers in Multi-Vehicle Fatal Crashes by Crash Outcome, Time of Day, and Period of Week, 1999

Time and Period	Percent with BAC 0.00	0.01-0.09	0.10+	Total Drivers
Fatally Injured Drivers				
Day				
Weekday	92	3	4	6,402
Weekend	85	5	10	2,031
Night				
Weekday	69	7	24	2,237
Weekend	58	10	32	2,404
Surviving Drivers				
Day				
Weekday	97	2	2	10,528
Weekend	94	3	4	3,639
Night				
Weekday	84	6	10	3,438
Weekend	78	8	14	3,999

surviving drivers to have BAC levels of 0.10 or above in each day and time class. The absolute differences ranged from 2 to 6 percentage points (weekday and weekend daytime) to 14 to 18 percentage points (weekday and weekend nighttime).

Driver Sex

Table 22 shows that male drivers involved in fatal crashes are much more likely to be intoxicated than are female drivers. Table 23 shows that the same is true for all day and time periods.The differences in alcohol involvement for male and female drivers are even more marked for fatally injured drivers (Table 24).

Driver Age

The overall distribution of alcohol involvement by driver age is shown in Table 25. The percentage of drunk drivers is highest at ages 21 through 24, decreasing to 5 percent for drivers 65 years or older. The age-alcohol pattern seen for all drivers in fatal crashes—a rapid increase to a peak in the 21 to 24 age group followed by a slower decrease—remains unchanged when specific groups are considered (for example, fatally injured drivers or drivers in single-vehicle crashes).

Table 22. BAC Distributions for Drivers in Fatal Crashes by Sex, 1999

Sex	Percent with BAC 0.00	0.01-0.09	0.10+	Total Drivers
Male	74	6	20	40,900
Female	86	4	10	14,792

Table 23. BAC Distributions for Drivers in Fatal Crashes by Sex, Time of Day, and Period of Week, 1999

Time and Period	Percent with BAC 0.00	0.01-0.09	0.10+	Total Drivers
Male Drivers				
Day				
Weekday	92	3	5	15,631
Weekend	81	5	13	5,971
Night				
Weekday	63	8	29	8,642
Weekend	52	10	37	10,399
Female Drivers				
Day				
Weekday	95	2	3	7,018
Weekend	92	3	5	2,362
Night				
Weekday	75	6	19	2,558
Weekend	70	8	22	2,810

Table 24. BAC Distributions for Fatally Injured Drivers by Sex, Time of Day, and Period of Week, 1999

Time and Period	Percent with BAC 0.00	0.01-0.09	0.10+	Total Drivers
Male Drivers				
Day				
Weekday	86	4	9	6,355
Weekend	71	8	22	2,619
Night				
Weekday	48	9	44	4,205
Weekend	35	10	55	5,045
Female Drivers				
Day				
Weekday	93	3	5	3,277
Weekend	89	3	8	1,075
Night				
Weekday	62	6	32	1,172
Weekend	57	8	35	1,201

Table 25. Drivers with BAC 0.10+ in Fatal Crashes by Person Age, 1999

Person Age (Years)	Total Drivers in Fatal Crashes	Drivers with BAC 0.10+	
		Number	Percent
0-15	332	12	4
16-20	7,973	1,088	14
21-24	5,620	1,518	27
25-29	6,075	1,469	24
30-34	5,659	1,295	23
35-39	5,763	1,289	22
40-44	5,260	1,045	20
45-49	4,180	658	16
50-54	3,520	447	13
55-64	4,592	446	10
65+	6,559	295	5

Driver Age Groups

To highlight the differences among drivers of different ages, driver age can be classified into three groups: 15 to 20 years, 21 to 44, and 45 or older. (In all the states, drivers 15 to 20 years old are now legally prohibited from purchasing alcohol.) Table 26 shows the BAC distribution for the three age groups.

Table 26. BAC Distributions for Drivers in Fatal Crashes by Age Group, 1999

Age Group (Years)	Percent with BAC			Total Drivers
	0.00	0.01-0.09	0.10+	
15-20	79	7	13	8,175
21-44	70	7	23	28,377
45+	87	4	10	18,851

Two observations from Table 26 merit special mention:

- The percentages of legally intoxicated drivers in the three age groups differ markedly.
- The percentage of drivers with BAC 0.01-0.09 is significantly lower for drivers over 44 years old.

Tables 27 and 28 show the distribution of fatally injured drivers with BAC 0.10+ in single-vehicle and multi-vehicle crashes by time of day on weekdays and weekends for the three age groups. For both single- and multi-vehicle fatal crashes, drivers in the 21 to 44 year age group had the highest rate of intoxication in each time period.

Table 27. Distribution of Fatally Injured Drivers with BAC 0.10+ in Single-Vehicle Crashes by Time of Day, Period of Week, and Age Group, 1999

Time and Period	Percent of Drivers with BAC 0.10+ by Age Group (Years)		
	15-20	21-44	45+
Day			
Weekday	5	21	13
Weekend	16	36	24
Night			
Weekday	38	62	44
Weekend	46	70	53

Table 28. Distribution of Fatally Injured Drivers with BAC 0.10+ in Multi-Vehicle Crashes by Time of Day, Period of Week, and Age Group, 1999

Time and Period	Percent of Drivers with BAC 0.10+ by Age Group (Years)		
	15-20	21-44	45+
Day			
Weekday	2	7	3
Weekend	8	16	5
Night			
Weekday	12	32	16
Weekend	19	41	20

Vehicle Class

All but about 2 percent of the vehicles involved in fatal crashes fall into one of the following types:

- motorcycles
- passenger cars
- light trucks and vans (including sport utility vehicles)
- medium trucks
- heavy trucks.

Table 29 shows the number of vehicles of each type involved in fatal crashes in 1999, together with the BAC distributions for their drivers. The highest rate of driver intoxication is seen for motorcycles, followed by light trucks and vans and passenger cars.

Table 29. BAC Distributions for Drivers in Fatal Crashes by Vehicle Type, 1999

Vehicle Type	Percent of Drivers with BAC 0.00	0.01-0.09	0.10+	Total Vehicles
Motorcycles	62	10	28	2,515
Passenger Cars	77	6	17	27,806
Light Trucks*	74	6	20	19,801
Medium Trucks	97	1	2	471
Heavy Trucks	98	1	1	4,376

*Includes pickup trucks, vans, and sport utility vehicles.

Vehicle Age

Drivers of older vehicles involved in fatal crashes in 1999 were more likely than drivers of newer vehicles to have been drinking when the crashes occurred (Table 30). As shown in Table 31, this was true for drivers of all ages.

Table 30. BAC Distributions for Drivers in Fatal Crashes by Vehicle Model Year, 1999

Model Year	Percent of Drivers with BAC 0.00	0.01-0.09	0.10+	Total Vehicles
Older than 1984	68	7	25	5,116
1984-1987	73	6	21	7,791
1988-1991	76	6	18	12,265
1992-2000	80	5	15	30,307

Table 31. Drivers with BAC 0.10+ in Fatal Crashes by Person Age and Vehicle Model Year, 1999

Person Age (Years)	Percent of Drivers with BAC 0.10+ by Vehicle Model Year: Older than 1984	1984-1987	1988-1991	1992-2000
15-19	12	12	11	12
20-24	29	29	26	24
25-29	29	30	28	21
30-44	36	28	23	17
45-59	23	18	15	10
60+	9	6	5	5

Restraint Use

Sober drivers in fatal crashes are considerably more likely to be reported as wearing their seat belts at the time of the crash than are intoxicated drivers. Table 32 shows the proportions of fatally injured and surviving drivers in the three BAC groups who were reported to have been using safety belts at the time of the crash. Drivers in the 0.01-0.09 group were belted 34 percent less often than were sober drivers (BAC 0.00), and intoxicated drivers were restrained much less often than those in either of the other BAC groups.

Similarly, Table 33 shows that drivers who were using their safety belts at the time of a fatal crash were much less likely to have been drinking than were unrestrained drivers, regardless of whether or not they were fatally injured.

Table 32. Safety Belt Use Rates for Fatally Injured and Surviving Drivers of Passenger Vehicles in Fatal Crashes by BAC Group, 1999

Drivers	Percent of Drivers Using Safety Belts by BAC Group: 0.00	0.01-0.09	0.10+
Fatally Injured	48	30	19
Surviving	81	60	46

Table 33. BAC Distributions for Fatally Injured and Surviving Drivers of Passenger Vehicles in Fatal Crashes by Safety Belt Use, 1999

Drivers	Belt Use	Percent of Drivers with BAC 0.00	0.01-0.09	0.10+	Total Drivers
Fatally Injured	Yes	81	5	14	7,834
	No	55	7	38	12,289
Surviving	Yes	90	4	6	17,589
	No	69	9	21	5,354

5. Alcohol Trends, 1982-1999

Alcohol involvement in fatal crashes decreased between 1982 and 1999. The decrease was not uniform; alcohol involvement dropped more for some crash types than for others. This chapter describes some of the major changes.

Table 34 shows the year-to-year distribution of alcohol involvement in fatal crashes. Figure 3 shows the year-to-year BAC distributions for drivers in fatal crashes.

Tables 35, 36, and 37 illustrate several facts of special interest. The reduction in alcohol involvement for drivers under 21 years of age (Table 35) is especially large and is seen for all times of day and all periods of the week. For drivers 21 to 44 years old (Table 36) the average reduction is much smaller, especially for nighttime driving, when alcohol involvement is notoriously high. For drivers 45 years and older there is a large reduction in drunk driving during the day, as well as a smaller but substantial reduction for nighttime driving.

Table 34. Fatal Crash BAC Distributions, 1982-1999

Year	Percent of Crashes with Crash BAC 0.00	0.01-0.09	0.10+	Total Crashes
1982	43	11	46	39,092
1983	45	10	45	37,976
1984	47	11	43	39,631
1985	48	10	41	39,196
1986	48	11	41	41,090
1987	49	11	40	41,438
1988	50	10	40	42,130
1989	51	10	39	40,741
1990	51	10	40	39,836
1991	52	9	38	36,937
1992	54	9	36	34,942
1993	57	9	35	35,780
1994	59	8	32	36,254
1995	59	9	33	37,241
1996	59	9	32	37,494
1997	62	8	30	37,324
1998	61	8	30	37,107
1999	62	8	30	37,043

Figure 3. Estimated Proportion of Drivers in Fatal Crashes Who Were Drunk or Impaired, 1982-1999

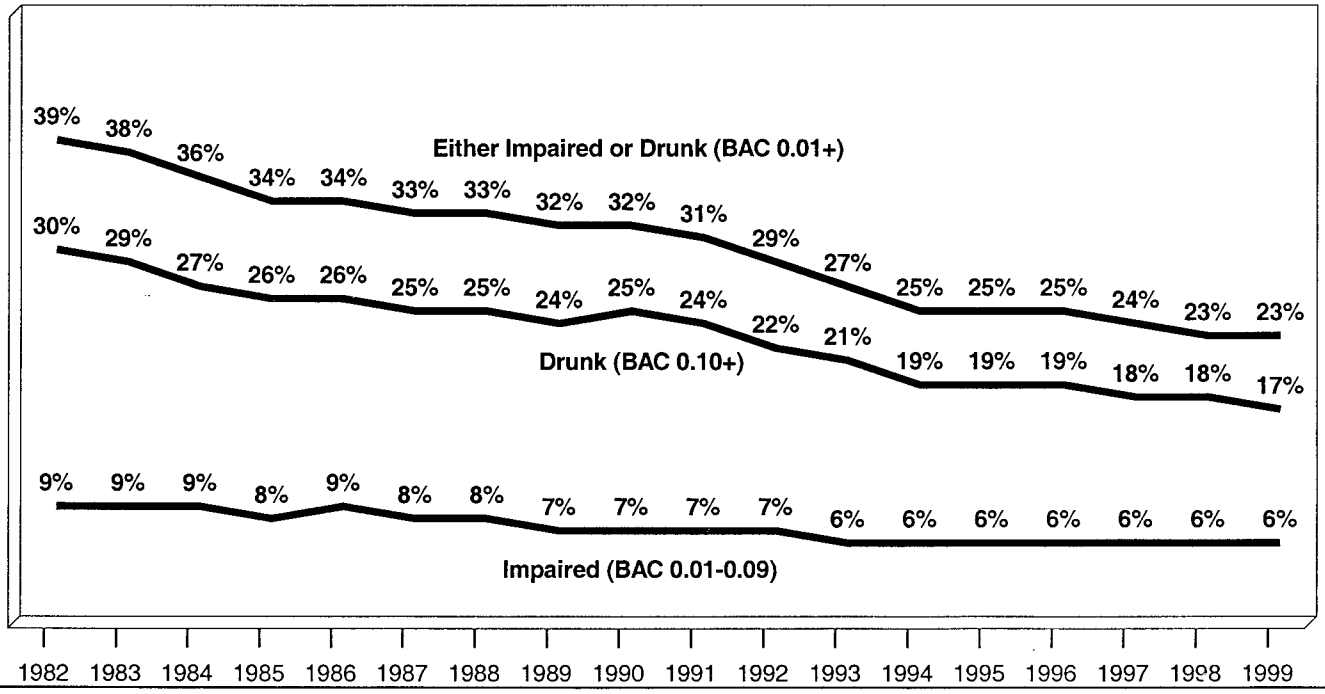


Table 35. Reduction in High-BAC (0.10+) Drivers 16 to 20 Years Old in Fatal Crashes by Time of Day and Period of Week, 1982-1999

Time and Period	Percent of Drivers with BAC 0.10+ 1982	1999	Percent Reduction, 1982-1999
Day			
Weekday	9	2	78
Weekend	15	8	47
Night			
Weekday	40	22	45
Weekend	47	26	45

Note: Data do not include nonoccupant crashes.

Table 36. Reduction in High-BAC (0.10+) Drivers 21 to 44 Years Old in Fatal Crashes by Time of Day and Period of Week, 1982-1999

Time and Period	Percent of Drivers with BAC 0.10+ 1982	1999	Percent Reduction, 1982-1999
Day			
Weekday	12	6	50
Weekend	24	15	38
Night			
Weekday	48	37	23
Weekend	53	45	15

Note: Data do not include nonoccupant crashes.

Table 37. Reduction in High-BAC (0.10+) Drivers 45 Years and Older in Fatal Crashes by Time of Day and Period of Week, 1982-1999

Time and Period	Percent of Drivers with BAC 0.10+ 1982	1999	Percent Reduction, 1982-1999
Day			
Weekday	9	4	56
Weekend	14	8	43
Night			
Weekday	30	20	33
Weekend	34	26	24

Note: Data do not include nonoccupant crashes.

Table 38 shows reductions in drunk driving by vehicle type. Although alcohol involvement is generally low for drivers operating commercial vehicles (medium and heavy trucks), sizable reductions occurred for those drivers between 1982 and 1999. Motorcycle drivers had not only the highest percentage of alcohol involvement in 1999 but also the smallest reduction in drunk driving from 1982 to 1999.

Table 38. Reduction in High-BAC (0.10+) Drivers in Fatal Crashes by Vehicle Type, 1982-1999

Vehicle Type	Percent of Drivers with BAC 0.10+ 1982	1999	Percent Reduction, 1982-1999
Motorcycles	41	28	32
Passenger Cars	31	17	45
Light Trucks*	35	20	43
Medium Trucks	5	2	60
Heavy Trucks	4	1	75

*Includes pickup trucks, vans, and sport utility vehicles.

Figure 4 shows that the alcohol involvement rate for motorcycle drivers remained fairly constant between 1982 and 1986, dropped sharply in 1987 and 1988, and rose again in 1989. In contrast, the involvement rate for passenger car drivers declined steadily over the entire period.

For drivers of light trucks and vans, there was a sharp drop in the involvement rate from 1982 to 1985, after which it fluctuated at around the same level before beginning a sharp decline in 1991. Drivers of medium and heavy trucks continue to have low rates of alcohol involvement in fatal crashes.

Female drivers not only are less frequently drunk than males but also show a greater reduction in alcohol involvement in fatal crashes from 1982 to 1999 (Table 39).

Figure 4. Estimated Proportion of Drunk Drivers (BAC 0.10+) in Fatal Crashes by Vehicle Type, 1982-1999

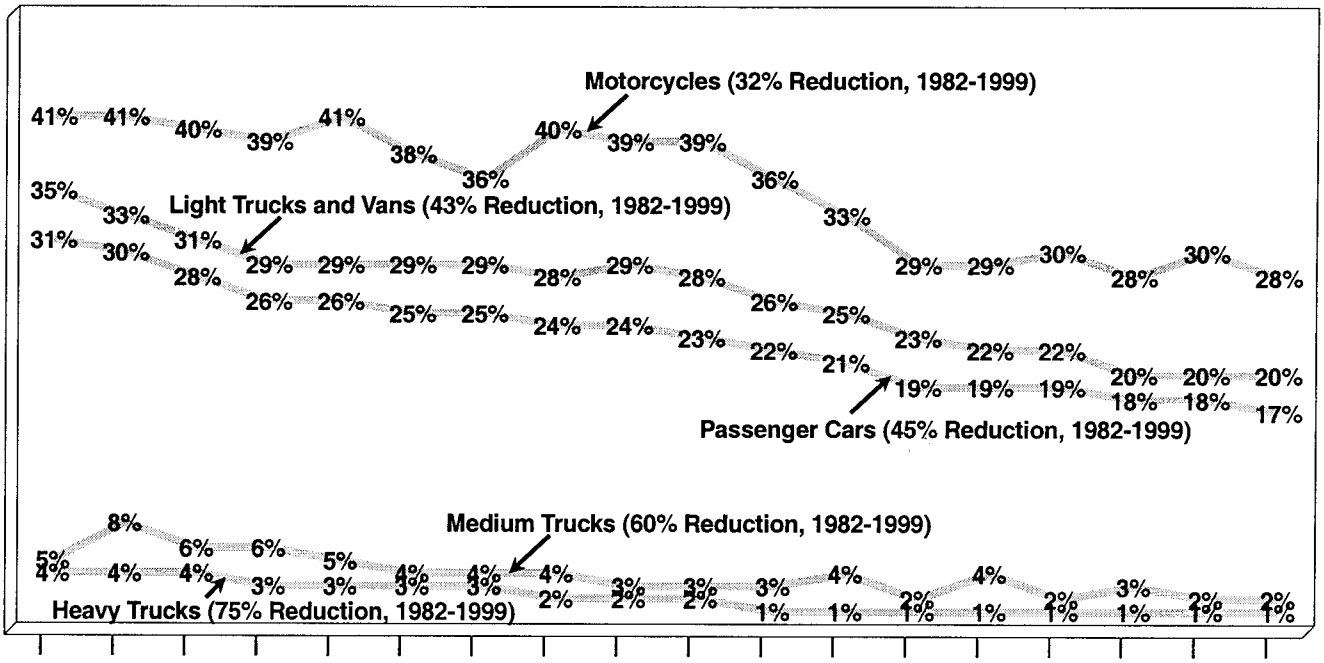


Table 39. Reduction in High-BAC (0.10+) Drivers in Fatal Crashes by Sex, 1982-1999

Sex	Percent of Drivers with BAC 0.10+ 1982	1999	Percent Reduction, 1982-1999
Male	32	20	38
Female	19	10	47
All Drivers	30	17	43

A different aspect of alcohol trends is shown in Table 40, which shows the reductions in high BAC (0.10+) driver involvement in fatal crashes from 1982 to 1999 by land use and crash type. Overall, the proportion of drunk drivers (BAC 0.10+) in fatal crashes dropped by 33 percent in urban areas and by 38 percent in rural areas.

Table 40. Reduction in High-BAC (0.10+) Drivers in Fatal Crashes by Land Use and Crash Type, 1982-1999

Land Use and Crash Type	Percent of Drivers with BAC 0.10+ 1982	1999	Percent Reduction, 1982-1999
Urban			
Single-Vehicle	56	41	27
Multi-Vehicle	38	20	47
Nonoccupant	42	38	10
Total	**46**	**31**	**33**
Rural			
Single-Vehicle	55	39	29
Multi-Vehicle	34	17	50
Nonoccupant	51	38	25
Total	**47**	**29**	**38**