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Drinking and driving among adults in the United States: Results from the 2012–2013 national epidemiologic survey on alcohol and related conditions-III

Amy Z. Fan[a,*], **Bridget F. Grant**[b], **W. June Ruan**[a], **Boji Huang**[a], **S. Patricia Chou**[a]

[a]Epidemiology and Biometry Branch, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, 6700B Rockledge Dr., Room 2132, Bethesda, MD, United States

[b]FedPoint Systems, LLC, Fairfax, VA 22033, United States

Abstract

Despite the seriousness of alcohol-impaired driving (A-ID) very few national surveys on reported A-ID have been conducted since the early 2000s. This study examined 12-month prevalences of driver-based A-ID and passenger-based alcohol-related practices in a large representative sample of the U.S. population. Twelve-month prevalences of drinking while driving and driving after drinking too much were 5.7% and 3.9%, respectively. Corresponding prevalences of having an accident while intoxicated and having an accident with an injury while intoxicated were 0.6% and 0.2%, respectively. Twelve-month prevalences of riding as a passenger with a drinking driver and riding as a passenger while drinking were 7.0% and 10.7%, respectively. In general, sociodemographic characteristics of individuals more vulnerable to all of these A-ID practices were similar: men, Whites, Blacks and Native Americans, younger and middle-aged adults, upper socioeconomic status, being never or previously married, and residing in the Midwest. Results of this study underscore the importance of assessing driver-based A-ID and passenger-based alcohol-related practices and the need to target prevention and intervention programs to reduce these practices among those subgroups of the U.S. population most vulnerable to them.

Keywords

Drinking and driving; Driver-based alcohol-impaired driving; Passenger-based drinking and driving practices; Epidemiology; National survey

1. Introduction

Motor vehicle crashes (MVCs) are a leading cause of death in the United States. Since 2013, approximately 35,000 people are killed and 2 million injured each year in MVCs (Center for Disease Control and Prevention, 2015). Nearly one-third of all motor vehicle fatalities have been attributed to alcohol-impaired driving (A-ID), representing an average of 1 fatality

*Corresponding author. amy.fan@nih.gov (A.Z. Fan).

every 50 min (Center for Disease Control and Prevention, 2015; National Highway Traffic Safety Administration, 2015, 2017a). The economic costs of motor vehicle crashes have been estimated at $242 billion, of which $44 billion resulted from A-ID (Blincoe et al., 2015).

Despite the seriousness of A-ID as a major public health problem, very few national surveys on reported A-ID have been conducted since the early 2000s. Estimates of driver-based A-ID during this time have varied, largely due to differences in definitions of A-ID, reporting period, and age of respondents. Past-month prevalences of A-ID, defined as driving after drinking too much, ranged from 1.8% (Center for Disease Control and Prevention, 2011; Jewett et al., 2015) to 7.1% (Shults et al., 2009) among adults (age 18 years and older). Among individuals aged 16 years and older, past-month prevalence of driving a motor vehicle within two hours of drinking was 13% (National Highway Traffic Safety Administration, 2010). Twelve-month prevalences of driving while drinking and driving after drinking too much were 4.5% and 2.9% among adults, respectively (Chou et al., 2006). In another study, the 12-month prevalence of driving while under the influence of alcohol was 11.6% among individuals aged 16 years and older (Lipari et al., 2016).

Even fewer studies have addressed reported prevalences of passenger-based alcohol-related practices. Past-month and 12-month prevalences of riding with a driver who had too much to drink were 5.0% and 4.9% among adults (Dellinger et al., 1999; Shults et al., 2009) and 8.0% (National Highway Traffic Safety Administration, 2010) among individuals aged 16 years and older, respectively. In one unique study (Chou et al., 2006), 12-monthy prevalence of riding as a passenger with a drinking driver was 6.6% and riding as a passenger while drinking was 7.6% among adults.

Surveys on the prevalences of a broad array of driver-based A-ID in the general population have significant public health and traffic safety implications. Less than 1% of self-reported episodes of A-ID involve arrest and go undetected (Federal Bureau of Investigation, 2010). Further, most studies have examined driver-based A-ID practices while very few have assessed the magnitude of passenger-based alcohol-related practices. Understanding the broad spectrum of self-report A-ID practices is critical to formulating comprehensive, effective and evidence-based prevention and intervention programs. Information on sociodemographic profiles of driver-based A-ID and passenger-based alcohol-related practices is important to help identify those subgroups of the population most vulnerable to these practices that would most benefit from prevention and intervention efforts.

Accordingly, this study presents information on 12-month prevalences and sociodemographic characteristics in association with driver-based A-ID and passenger-based alcohol-related practices in a large (n = 36,090) nationally representative survey, the National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III: Grant et al., 2014). The number of driver-based and passenger-based measures assessed in this study were more extensive than those of prior research and included driving while drinking, driving after drinking too much, being involved in a vehicle accident while intoxicated, being involved in vehicle accident with an injury while intoxicated, riding as a passenger with a drinking driver and riding as a passenger in a vehicle while drinking.

2. Methods

2.1. Sample

The 2012–2013 NESARC-III's target population was the non-institutionalized civilian population of the U.S., 18 years and older, residing in households and selected group quarters (n = 36,309) (Grant et al., 2014). Multistage probability sampling was used to select respondents: primary sampling units (counties/groups of contiguous counties), secondary sampling units (groups of census-defined blocks), and tertiary sampling units (households within secondary sampling units). Blacks, Asians and Hispanics were oversampled. Data were adjusted for nonresponse and weighted to represent the US population based on the 2012 American Community Survey (US Census Bureau, 2012). Weighting adjustment compensated adequately for nonresponse (Grant et al., 2014). The household response rate was 72%, the person response rate was 84%, and the overall response rate was 60.1%, comparable to rates of other US national surveys (Adams et al., 2013; Substance Abuse and Mental Health Services Administration, 2012). The study protocol and informed consent procedures were approved by the National Institutes of Health and Westat (NESARC-III field contractor) institutional review boards.

2.2. Driver-based measures of drinking and driving (D & D)

Two questions were asked about driver-based D & D practices: "In your entire life, did you ever more than once drive a car or other vehicle while you were drinking?" and "In your entire life, did you ever more than once drive a car, motorcycle, truck, boat, or other vehicle after having too much to drink?". Follow-up questions "Did that happen in the past 12 months?" were asked if the answer to any of the preceding two lifetime questions were "yes".

2.3. Driver-based D & D practices leading to accidents and injuries (A & I)

Two questions ascertained alcohol-related A & I: "Did you ever drive a car, motorcycle, truck, and boat/other vehicle and have an accident while you were under the influence of alcohol?" and "Did you ever drive a car, motorcycle, truck, boat/other vehicle and injure yourself or someone else in an accident while under influence of alcohol?". Follow-up questions "Did that happen in the past 12 months?" were asked if answer to any of the preceding two lifetime questions was "yes".

2.4. Passenger-based alcohol-related practices

Two questions were passenger-based: "In your entire life, did you ever ride in a vehicle as passenger while the driver was drinking?" and "In your entire life, did you ever ride in a car as a passenger while you were drinking?" Follow-up questions "Did that happen in the past 12 months?" were asked if the answer to any of the preceding two lifetime questions was "yes".

2.5. Covariates

The following sociodemographic covariates were included in the regression analyses: sex, age at interview (18–29, 30–44, 45–64, ≥65 years), race-ethnicity (White, Black, Native

American, Asian/Pacific Islander, Hispanic), education (less than high school, high school, attended/completed college), marital status (married/cohabiting, widowed/separated/divorced, never married), family income (< $19,999, $20,000-$34-999, $35,000-$69,999, ≥ $70,000), urbanicity (urban, rural), and region (Northeast, Midwest, South, West).

2.6. Statistical analyses

All statistical analyses were conducted using SUDAAN 11.0 software (Research Triangle Institute, 2014) to accommodate the complex sample design of the NESARC-III. Weighted prevalences of driver-based and passenger-based measures and their respective standard errors were computed for the total sample and major sociodemographic subgroups. Adjusted prevalence ratios (APRs) for each outcome were obtained using LOGLINK procedure with all sociodemographic variables entered simultaneously. We conducted trend tests for age, education and family income levels. Any statistical test at $p < 0.05$ was determined to be significant. Bonferroni adjustment accounted for multiple group comparisons.

3. Results

3.1. Driver-based d & d practices

The 12-month prevalence of driving while drinking and driving after drinking too much more than once was 5.7% (SE = 0.2) and 3.9% (SE = 0.2), respectively (Table 1). The prevalence of D & D practices in men was twice as great as that in women. Younger adults reported higher prevalence of both D & D practices relative to the older age group (p for linear trend < 0.001). Asians/Pacific Islanders, Hispanics, and Blacks reported lower prevalence of driving after drinking than Whites, a result that generalized to Asians/Pacific Islanders and Hispanics for the driving while drinking practice. Adults with less than high school education had a lower prevalence of engaging in both D & D practices than those who attended/completed college. The prevalence of engaging in D & D practices among adults who were never or previously married were 1.5–2 times relative to those currently married/cohabitating. Adults with lower family income (≤$34,999) had lower prevalence of these D & D practices relative to those in the highest income group (≥$70,000) (p for linear trend < 0.05). Adults residing in the Midwest had greater prevalence of both D & D practices relative to those residing in the West.

3.2. Driver-based A & I

Twelve-month prevalences of having an accident while intoxicated and having an accident with an injury while intoxicated were 0.6% (SE = 0.05) and 0.2% (SE = 0.03) respectively (Table 2). Men were 2 times more likely than women to report accidents and nearly 4 times more likely to report accidents with an injury from intoxication (p for linear trend < 0.001). Younger adults had greater prevalence of each driver-based A & I practice relative to the oldest age group. Adults with less than high school education were almost three times more likely to report alcohol-related accidents with an injury relative to those who attended/completed college. Adults who were never or previously married had greater prevalence of both practices relative to those who were married/cohabitating. Adults residing in the South had a greater prevalence of having an accident with an injury while intoxicated relative to those residing in the West.

3.3. Passenger-based alcohol-related practices

The 12-month prevalence of riding with a drinking driver and riding as a passenger while drinking was 7.0% (SE = 0.2) and 10.7% (SE = 0.3), respectively (Table 3). Men were over 4 times more likely than women to ride with a drinking driver and 1.5 times more likely to ride as a passenger while drinking. Younger adults (≤64 years) had a greater prevalence of both passenger-based practices relative to those in the oldest age group (p for linear trend <0.001). Asians/Pacific Islanders and Hispanics had a lower prevalence of each passenger-based practice relative to Whites. The prevalence of having ridden as a passenger with a drinking driver among adults with high school education were 21% higher than those who attended/completed college. The prevalence of both passenger-based practices among adults who were never married were about 1.5 times than those married/cohabitating. Adults with the lowest family income (< $20,000) was associated with a 16% greater prevalence of riding with a drinking driver than those with the highest family income (≥$70,000).

4. Discussion

The 12-month prevalence of more than once driving after drinking too much was 3.9% in the U.S. population, representing 9,266,895 Americans. The corresponding prevalence of more than once driving while drinking was larger, 5.7% or 13,496,895 Americans. Prevalences of having an accident while intoxicated and having an accident with an injury while intoxicated were 0.6% and 0.2%, respectively. With regard to passenger-based alcohol-related practices, prevalences of riding with a drinking driver and riding as a passenger while drinking were 7.0% and 10.7% in the population, representing 16,361,545 and 25,232,216 U.S. adults. The prevalence of drinking while driving reported were (3.9%) is higher than reported in a previous study (2.9%; Chou et al., 2006), but lower than that in another study (7.1%; Shults et al., 2009) using similar age groups, time frames and definitions of A-ID. The absence of comparable studies on A-ID precludes further comparisons of prevalence of other driver-based and passenger-based practices assessed here.

The prevalence of more than once driving after drinking and driving while drinking appears to have increased since the 2001–2002 NESARC (Chou et al., 2006, from 2.9% to 3.9%, and from 4.5% to 5.9%), respectively, a survey that used definitions, time frame and age criteria identical to those used in the current study. This result contrasts with information on A-ID from roadside surveys and A-ID fatalities. There has been a large decrease in the percentage of drivers who were alcohol positive, from 35.9% in 1973, to 12.4% in 2007, to 8.3% in 2013–2014 as ascertained by the National Roadside Survey (National Highway Traffic Safety Administration, 2017b). MVC fatalities also declined 20% between 2007 and 2016 (National Highway Traffic Safety Administration, 2017b).

The discrepancy between the apparent increase in prevalence of self-report driver-based D & D practice and declining rates of alcohol-impaired driving and fatalities is not clear. The decline in alcohol-related fatalities may be due to a reduction in serious A-ID crashes (Shults et al., 2009) as a result of deterrence measures (e.g., seatbelt laws, sobriety checks). For example, the percentage of intoxicated drivers (blood alcohol concentration (BAC) ≥0.08 g/dl) with very high BACs (≥0.15 g/dl) has been declining in recent years from 67% in 2006 to 59% in 2012 (National Highway Traffic Safety Administration, 2012, 2013).

Results of analyses of NESARC and NESARC-III data on the percentage of individuals with no binge drinking and binge drinking at various levels (4/5, 8/10, 12/15 drinks among women/men, respectively) in the last 12-months for each D & D practice are consistent with declining rates of intoxicated drivers with very high BACs found in the National Roadside Survey. Prevalences of driving after drinking too much remained stable among nonbingers (0.4% to 0.4%), those drinking 4/5 drinks (6.1% to 6.3%) and those drinking 8/10 drinks (15.0% to 15.1%), but declined among the heaviest bingers (12/15 drinks), from 28.4% to 23.5%. Similarly, the prevalences of driving while drinking remained stable among nonbingers (1.0% to 1.0%) and those drinking 4/5 drinks (10.4% to 9.5%), but declined among those drinking 8/10 drinks (22.7% to 20.0%) and 12/15 drinks (33.2% to 30.6%). However, decreases of D & D behaviors among high bingers could not fully explain the discrepancies between increasing A-ID behaviors found in NESARC and declining rates of alcohol-impaired driving and fatalities reported from the National Road Survey. More national survey data are needed to clarify the temporal trend on A-ID behaviors among general population.

Consistent with data from the National Roadside Survey of Alcohol and Drug Use by Drivers (National Highway Traffic Safety Administration, 2011), MVC fatalities (National Highway Traffic Safety Administration, 2015) and the preponderance of the recent self-reported A-ID literature (Begen et al., 2011; Jewett et al., 2015; Lipari et al., 2016; Shults et al., 2009), men had greater rates of all driver-based and passenger-based practices assessed in this study than women. Patterns of alcohol consumption is closely related to A-ID (Hingson et al., 2017). The prevalence of binge drinking is greater among men than women (Esser et al., 2012) and a large majority (over 80%) of alcohol-impaired drivers are binge drinkers with nearly 90% of A-ID episodes involving binge drinkers (Flowers et al., 2008). Risk-taking behaviors (e.g., sensation seeking) are also more prevalent among men than women (Cross et al., 2013) and this predisposition has been linked to the A-ID (Cook et al., 2017; Jonah et al., 2001; Gonzalez-Iglesias et al., 2014). Gender differences in sensation seeking and binge drinking and other possible mechanisms influencing the greater rates of driver-based and passenger-based alcohol-related practices among men than women warrant further study.

The prevalence of driver-based and passenger-based practices examined in this study were greater among individuals younger than 65 years old relative to those 65 years and older. The greatest rates were among 18–29 and 30–44 year-olds, consistent with higher rates of driver-based and passenger-based practices found among never or previously married individuals. These findings are also consistent with prior self-reported studies of A-ID (Center for Disease Control and Prevention, 2011; Jewett et al., 2015; Lipari et al., 2016; Shults et al., 2009) and a study that identified being aged 35–54 years as a significant risk factor of driving after binge drinking (Naimi et al., 2009). Further, approximately 80% of drivers involved in fatal crashes since 2003 occurred among drivers between the ages of 21–44 (National Highway Traffic Safety Administration, 2017b).

Like male sex, sensation seeking and binge/heavy drinking has been associated with A-ID among young adults (Cook et al., 2017; Flowers et al., 2008; Van Beurden et al., 2005). Younger individuals are also less experienced drivers than older adults (Gonzalez-Iglesias et

al., 2015) that may explain, in part, the extremely high likelihood of having a vehicle accident when intoxicated among 18–29 year-olds (OR = 16.7) found in this study. Explanation for the high rates of driver-based and passenger-based practices in this study and MVC fatalities among 30–44 year-olds is less clear. However, estimated average miles driven annually are greatest among 30–44 year-olds (Triplett et al., 2015), suggesting that higher mean vehicle miles may increase the probability of A-ID among the middle-aged.

Whites, Blacks and Native Americans generally had greatest rates of driver-based D & D and both passenger-based alcohol-related practices were much greater than the rates seen among Asians/Pacific Islanders and Hispanics. These results are consistent with other reports showing higher rates of driver-based D & D and passenger-based alcohol-related practices among Whites, Native Americans and Blacks (Center for Disease Control and Prevention, 2011; Caetano and McGrath, 2005; Chou et al., 2006; Dellinger et al., 1999; Jewett et al., 2015). However, these findings are at variance with some studies that found high rates of these outcomes among Hispanics, especially for passenger-based alcohol-related practices (Center for Disease Control and Prevention, 2011; Chou et al., 2006; Jewett et al., 2015; Shults et al., 2009) and research on MVC fatalities for which Hispanic ethnicity constitutes a major risk factor (Torres et al., 2014). Differences in rates of these self-reported practices across race-ethnic groups have been attributed to differences in sociocultural factors (education and income (Caetano et al., 2008), levels of acculturation, (Hunter et al., 2006), religious and fatalistic beliefs (Sanchez et al., 2012), poor understanding of what constitutes driving under the influence of alcohol, (Florentine et al., 2007), erroneous risk perceptions (Caetano and Clark, 1998; Cherpitel and Tam, 2000), misinterpretation of traffic laws and regulations (Voas et al., 2012) and drinking patterns (Cherpitel and Tam, 2000; Florentine et al., 2007). Understanding the role of race-ethnicity in A-ID and MVCs is an important area of future research, especially among Hispanics in which reported rates of A-ID practices have been mixed.

Higher education and income were associated with greater rates of driver-based D & D, consistent with most prior research (Chou et al., 2006; Center for Disease Control and Prevention, 2011; Dellinger et al., 1999; Jewett et al., 2015; Shults et al., 2009). However, individuals in the lowest income group (< $20,000) and those with a high school education had greater rates of riding with a drinking driver practice, similar to results found in other studies (Chou et al., 2006; Dellinger et al., 2011; Shults et al., 2009). Although the majority, but not all, studies focusing on motor vehicle crashes and fatalities have found greater risk of driver-based D & D practices among lower than higher socioeconomic groups (Whitlock et al., 2003), many have not controlled for important sociodemographic and exposure factors. The relationship between greater socioeconomic status and self-report driver-based D & D found here may reflect several exposure-related factors. That is, individuals with higher education drive considerably more miles annually than those with lower education (Triplett et al., 2015). Individuals with greater incomes are also better able to purchase vehicles and therefore have greater access to them (Van den Berghe, 2017). Future research on A-ID controlling for other sociodemographic factors and exposure variables is warranted. Moreover, this study showed that income and education may differentially relate to driver-based and passenger-based A-ID, highlighting the need to examine both sets of A-ID practices in future research with adequate control of sociodemographic and exposure factors.

Driver-based D & D practices and passenger-based riding with a drinking driver practice was greater among individuals residing in the Midwest than those in the West, whereas individuals in the South had greater rates of driver-based vehicle accidents resulting in an injury. These results are consistent with some self-report studies examining driver-based A-ID (Chou et al., 2006; Center for Disease Control and Prevention, 2011; Dellinger et al., 1999) and passenger-based A-ID (Chou et al., 2006; Center for Disease Control and Prevention, 2011), but not all (Shults et al., 2009). These results parallel the proportion of population density, with density being lower in the Midwest, followed by South, Northeast and West (US Census Bureau, 2014). MVC fatalities are also greater in the rural than urban regions in the U.S. (Center for Disease Control and Prevention, 2012), strongly implicating the role of population density in MVC fatalities. One study conducted in four Midwest states (Muelleman and Mueller, 1996), indicated that lower population density was associated with more light and heavy truck vehicle types, more frequent alcohol use and higher levels of intoxication and MVC fatality rates. The highest prevalence of binge drinking associated with D & D practices has been linked to Midwestern metropolitan areas (Beck et al., 2017). Individuals residing in the Midwest and rural areas are significantly less likely to use seat belts (Beck et al., 2017; Strine et al., 2010) and those residing in the Midwest and South and in rural areas drive considerably more than those residing in the Northeast and West and in urban areas (Triplett et al., 2015). Further research on how seat belt use, vehicle types, patterns of alcohol use, vehicle miles travelled and other exposure factors impact higher rates of self-report A-ID practices is needed.

Limitations are noted. No biological testing was conducted in the NESARC-III to confirm alcohol use. The NESARC-III response rate (60.1%) was acceptable but lower than the 2001–2002 NESARC rate (81.0%). Weighting that compensated for nonresponse facilitated comparisons between the surveys. Surveys with lower response rates may miss more alcohol abusers (Zhao et al., 2009), potentially leading to lower rates of A-ID related behaviors seen in NESARC-III. However, rates of A-ID behaviors increased in the NEDARC-III (relative to the earlier NESARC), suggesting that the increases reported here may underestimate true increases in these behaviors. Self-report measures of A-ID practices may be underreported, especially for driver-based A-ID practices. Thus, our estimates of A-ID measures examined in this study are likely conservative. The NESARC-III did not measure A-ID occurring simultaneously with driving under the influence of other drugs and excluded the homeless and institutionalized individuals as do most national surveys.

Driving under the influence of alcohol and passenger-based alcohol-related practices remain a problem in the U.S. This study highlighted the public health importance of interventions to reduce A-ID giving consideration to both impaired drivers and their adult passengers. This study identified important sociodemographic characteristics, largely shared among both drivers and passengers, that could serve as important targets for prevention and intervention efforts, especially among men, young and middle-aged adults, Whites, Blacks and Native Americans, upper socioeconomic status, the never or previously married, and individuals residing in the Midwest. Taken together, this study suggests an urgent need for continued monitoring of A-ID and the development of targeted evidence-based prevention and intervention programs to reduce alcohol-impaired practices by drivers and passengers alike.

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Table 1

Twelve-month prevalences, adjusted prevalence ratios (APRs) and trend analyses of driver-based drinking and driving practices by sociodemographic characteristics.

Characteristic	More than once driving while drinking		More than once driving after drinking too much	
	% (SE)	APR (95% CI)	% (SE)	APR(95% CI)
Total	5.73 (0.20)		3.94 (0.15)	
Sex				
Men	8.19 (0.31)	**2.33 (2.10–2.61)**	5.56 (0.22)	**2.20 (1.95–2.48)**
Women	3.46 (0.19)	1.00	2.43 (0.15)	1.00
Age				
18–29	8.32 (0.44)	**3.96 (3.07–5.10)**	6.29 (0.33)	**6.49 (4.35–9.68)**
30–44	6.94 (0.34)	**3.54 (2.80–4.49)**	4.76 (0.26)	**5.87 (3.96–8.71)**
45–64	5.11 (0.25)	**2.50 (1.96–3.19)**	3.43 (0.22)	**4.09 (2.73–6.12)**
65+	2.00 (0.24)	1.00	0.82 (0.16)	1.00
P for linear trend	< 0.001		< 0.001	
Race/ethnicity				
White, non-Hispanic	6.22 (0.28)	1.00	4.44 (0.19)	1.00
Black, non-Hispanic	6.02 (0.47)	0.85 (0.70–1.03)	3.42 (0.32)	**0.63 (0.51–0.78)**
Native American	5.49 (1.19)	0.89 (0.58–1.38)	4.18 (1.21)	0.93 (0.55–1.58)
Asian/Pacific Islander	1.72 (0.38)	**0.26 (0.17–0.41)**	1.53 (0.34)	**0.30 (0.19–0.48)**
Hispanic	4.91 (0.34)	**0.73 (0.63–0.86)**	3.01 (0.26)	**0.59 (0.49–0.72)**
Education				
< High school	4.00 (0.35)	**0.74 (0.61–0.89)**	2.06 (0.22)	**0.61 (0.47–0.78)**
High school	5.85 (0.29)	0.95 (0.83–1.07)	4.35 (0.28)	1.07 (0.91–1.24)
Attended/completed college	6.05 (0.26)	1.00	4.16 (0.19)	1.00
P for linear trend	< 0.001		< 0.001	
Marital status				
Married/cohabitating	4.66 (0.22)	1.00	2.86 (0.17)	1.00
Widowed/divorced/separated	5.76 (0.32)	**1.69 (1.48–1.94)**	3.87 (0.27)	**1.92 (1.60–2.30)**
Never married	8.46 (0.45)	**1.46 (1.27–1.68)**	6.76 (0.36)	**1.89 (1.62–2.20)**
Family income				

Characteristic	More than once driving while drinking		More than once driving after drinking too much	
	% (SE)	APR (95% CI)	% (SE)	APR(95% CI)
0–$19,999	5.43 (0.37)	**0.82 (0.69–0.98)**	3.82 (0.30)	0.84 (0.69–1.02)
$20,000–$34,999	5.24 (0.33)	**0.83 (0.71–0.96)**	3.42 (0.25)	**0.80 (0.66–0.98)**
$35,000–$69,999	6.00 (0.30)	0.93 (0.82–1.06)	4.33 (0.22)	1.00 (0.85–1.17)
≥ $70,000	6.02 (0.33)	1.00	4.00 (0.26)	1.00
P for linear trend	0.013		0.02	
Urbanicity				
Urban	5.81 (0.21)	1.00	4.15 (0.16)	1.00
Rural	5.43 (0.48)	0.95 (0.79–1.14)	3.16 (0.34)	0.78 (0.62–0.98)
Region				
Northeast	4.19 (0.40)	**0.78 (0.62–0.99)**	3.12 (0.22)	**0.79 (0.65–0.96)**
Midwest	7.17 (0.51)	**1.30 (1.06–1.59)**	5.15 (0.41)	**1.27 (1.03–1.55)**
South	6.14 (0.37)	1.18 (0.97–1.43)	3.82 (0.26)	1.04 (0.86–1.25)
West	4.97 (0.35)	1.00	3.65 (0.25)	1.00

Note: SE = standard error; CI = confidence interval.

Table 2

Twelve-month prevalences, adjusted prevalence ratios (APRs) and trend analyses of driver-based accidents and injuries while intoxicated by sociodemographic characteristics.

Characteristic	Riding with a drinking driver		Riding as a passenger while drinking	
	% (SE)	APR(95% CI)	% (SE)	APR(95% CI)
Total	6.95 (0.23)		10.72 (0.33)	
Sex				
Men	8.32 (0.31)	**1.42 (1.29–1.56)**	13.01 (0.41)	**1.47 (1.37–1.57)**
Women	5.68 (0.25)	1.00	8.59 (0.34)	1.00
Age				
18–29	13.08(0.56)	**7.79 (5.98–10.16)**	20.84 (0.69)	**11.61 (9.25–14.56)**
30–44	8.03 (0.38)	**5.71 (4.40–7.39)**	12.41 (0.55)	**7.85 (6.27–9.82)**
45–64	5.08 (0.31)	**3.49 (2.69–4.53)**	7.75 (0.35)	**4.73 (3.71–6.02)**
65 +	1.54 (0.20)	1.00	1.68 (0.19)	1.00
P for linear trend	< 0.001		< 0.001	
Race/ethnicity				
White, non-Hispanic	6.82 (0.29)	1.00	10.78 (0.41)	1.00
Black, non-Hispanic	9.23 (0.59)	1.02 (0.88–1.18)	12.73 (0.69)	0.94 (0.83–1.06)
Native American	10.08(1.66)	1.33 (0.98–1.80)	13.99 (2.06)	1.19 (0.92–1.55)
Asian/Pacific Islander	3.57 (0.64)	**0.49 (0.34–0.71)**	5.87 (0.61)	**0.48 (0.38–0.60)**
Hispanic	6.70 (0.38)	**0.77 (0.67–0.88)**	10.38 (0.45)	**0.77 (0.69–0.86)**
Education				
< High school	7.14 (0.56)	1.14 (0.95–1.35)	9.26 (0.64)	0.91 (0.79–1.06)
High school	8.20 (0.42)	**1.21 (1.08–1.34)**	11.27 (0.38)	1.01 (0.93–1.10)
Attended/completed college	6.39 (0.26)	1.00	10.80 (0.40)	1.00
P for linear trend	0.17		0.21	
Marital status				
Married/cohabitating	5.07 (0.24)	1.00	7.98 (0.33)	1.00
Widowed/divorced/separated	6.09 (0.36)	**1.48 (1.28–1.72)**	8.96 (0.39)	**1.52 (1.38–1.68)**
Never married	12.53(0.54)	**1.49 (1.31–1.69)**	19.29 (0.70)	**1.46 (1.33–1.60)**
Family income				

Characteristic	Riding with a drinking driver		Riding as a passenger while drinking	
	% (SE)	APR(95% CI)	% (SE)	APR(95% CI)
0–$19,999	8.94 (0.49)	**1.16 (1.00–1.34)**	12.51 (0.59)	1.01 (0.90–1.13)
$20,000–$34,999	7.46 (0.38)	1.09 (0.96–1.24)	10.90 (0.52)	0.98 (0.88–1.08)
$35,000–$69,999	6.39 (0.31)	0.98 (0.86–1.12)	10.17 (0.44)	0.94 (0.85–1.04)
≥$70,000	5.68 (0.33)	1.00	9.78 (0.44)	1.00
P for linear trend	0.02		0.73	
Urbanicity				
Urban	7.01 (0.24)	1.00	10.89 (0.32)	1.00
Rural	6.72 (0.51)	1.02 (0.87–1.19)	10.07 (0.65)	1.02 (0.90–1.17)
Region				
Northeast	6.00 (0.39)	0.99 (0.82–1.19)	9.66 (0.56)	0.93 (0.79–1.10)
Midwest	8.20 (0.59)	**1.29 (1.08–1.55)**	11.73 (0.78)	1.10 (0.92–1.30)
South	7.37 (0.42)	1.15 (0.97–1.38)	11.14 (0.62)	1.06 (0.90–1.26)
West	5.86 (0.38)	1.00	9.94 (0.55)	1.00

Note: SE = standard error; CI = confidence interval.

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Table 3

Twelve-month prevalences, adjusted prevalence ratios (APRs) and trend analyses of passenger-based alcohol-related practices by sociodemographic characteristics.

Characteristic	Had a vehicle accident while intoxicated		Had a vehicle accident with injury while intoxicated	
	% (SE)	APR(95% CI)	% (SE)	APR(95% CI)
Total	0.611 (0.050)		0.232 (0.033)	
Sex				
Men	0.857 (.090)	**2.16 (1.55–3.01)**	0.386 (.061)	**3.87 (2.35–6.38)**
Women	0.384 (.051)	1.00	0.089 (.021)	1.00
Age				
18–29	1.180 (.144)	**16.69 (5.96–46.76)**	0.329 (.095)	**3.20 (0.63–16.17)**
30–44	0.738 (.084)	**14.81 (5.63–38.97)**	0.298 (.055)	**5.02 (1.11–22.78)**
45–64	0.445 (.074)	**8.55 (3.18–22.99)**	0.214 (.048)	3.99 (0.86–18.56)
65 +	0.056 (.027)	1.00	0.050 (.041)	1.00
P for linear trend	< 0.001		0.05	
Race/ethnicity				
White, non-Hispanic	0.592 (.062)	1.00	0.228 (.045)	1.00
Black, non-Hispanic	0.670 (.096)	0.75 (0.53–1.05)	0.341 (.084)	0.82 (0.43–1.57)
Native American	1.201 (.602)	1.77 (0.64–4.90)	0.084 (.086)	0.34 (0.05–2.44)
Asian/Pacific Islander	0.522 (.200)	0.78 (0.36–1.68)	0.106 (.081)	0.48 (0.10–2.44)
Hispanic	0.623 (.098)	0.74 (0.50–1.11)	0.223 (.056)	0.64 (0.33–1.25)
Education attainment				
< High school graduate	0.764 (.125)	1.46 (0.94–2.29)	0.261 (.077)	2.09 (0.94–4.65)
High school graduate	0.654 (.109)	1.12 (0.76–1.66)	0.429 (.093)	**2.88 (1.55–5.34)**
Attended/completed college	0.561 (.060)	1.00	0.142 (.026)	1.00
P for linear trend	0.13		0.14	
Marital status				
Married/cohabitating	0.301 (.043)	1.00	0.130 (.029)	1.00
Widowed/divorced/separated	0.700 (.116)	**3.32 (2.01–5.49)**	0.216 (.054)	**1.97 (1.11–3.49)**
Never married	1.331 (.156)	**2.92 (1.76–4.84)**	0.506 (.101)	**3.53 (1.72–7.23)**
Family income				

Characteristic	Had a vehicle accident while intoxicated		Had a vehicle accident with injury while intoxicated	
	% (SE)	**APR(95% CI)**	**% (SE)**	**APR(95% CI)**
0–$19,999	0.847 (.106)	0.94 (0.56–1.59)	0.266 (.059)	0.85 (0.33–2.24)
$20,000–$34,999	0.633 (.105)	0.85 (0.50–1.45)	0.256 (.066)	0.99 (0.38–2.57)
$35,000–$69,999	0.481 (.083)	0.71 (0.44–1.15)	0.258 (.059)	1.12 (0.53–2.39)
≥ $70,000	0.539 (.097)	1.00	0.168 (.057)	1.00
P for linear trend	0.97		0.71	
Urbanicity				
Urban	0.656 (.058)	1.00	0.258 (.040)	1.00
Rural	0.445 (.098)	0.77 (0.47–1.26)	0.133 (.051)	0.47 (0.19–1.16)
Region				
Northeast	0.625 (.145)	1.17 (0.65–2.11)	0.199 (.082)	1.25 (0.47–3.30)
Midwest	0.652 (.104)	1.23 (0.76–2.00)	0.231 (.086)	1.49 (0.62–3.58)
South	0.627 (.075)	1.18 (0.77–1.83)	0.301 (.057)	**1.99 (1.01–3.94)**
West	0.538 (.100)	1.00	0.146 (.040)	1.00

Note: SE = standard error; CI = confidence interval.