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Sociodemographic Predictors of Pattern and Volume of Alcohol Consumption across Hispanics, Blacks, and Whites: 10-year trend (1992–2002)

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Abstract

Background—There have been limited trend studies examining variations on the patterns of alcohol consumption among Whites, Blacks and Hispanics in the United States. The current paper reports national trends in drinking patterns, volume of drinking (number of drinks per month), binge drinking and drinking to intoxication among Blacks, Whites and Hispanics over a period of 10 years and identifies sociodemographic predictors of these behaviors across the 3 ethnic groups.

Methods—Data are from the 1991–1992 National Longitudinal Alcohol Epidemiologic Survey (NLAES; n = 42,862) and the 2001–2002 National Epidemiologic Study on Alcohol and Related Conditions (NESARC; n = 43,093). Both surveys used multistage cluster sample procedures to select respondents 18 years of age and older from the U.S. household population.

Results—Trends varied across different dimensions of drinking and ethnic groups. There were no statistically significant differences in the mean number of drinks consumed per month among men and women in any of the 3 ethnic groups between 1992 and 2002, but there was a significant rise in the proportion of current drinkers in both genders and in all three ethnic groups. Multivariate analysis indicated that, compared to Whites in 1992, Blacks and Hispanics did not increase their volume of drinking, but Whites did. Drinking 5 or more drinks in a day at all did not increase between 1992 and 2002, but drinking 5 or more drinks at least once a month was more likely for all groups in 2002 compared to Whites in 1992. Drinking to intoxication at all was more likely among Whites in 2002 than 1992, but drinking to intoxication at least once a month was more likely among Whites and Blacks in 2002 than 1992.

Conclusion—The only common trend between 1992 and 2002 across both genders and three ethnic groups was a rise in the proportion of drinkers. There was also a rise in drinking 5 or more drinks in a day (Whites, Blacks and Hispanics) and drinking to intoxication (Whites and Blacks) but this was limited to those reporting such drinking at least once a month. The reasons for these changes are many and may involve complex sociodemographic changes in the population. It is important for the field to closely monitor these cross-ethnic trends in alcohol consumption.

Keywords

Ethnicity; Race; Binge drinking; Drunkenness; Intoxication; Whites; Blacks; Hispanics

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INTRODUCTION

There is a significant body of epidemiological literature on drinking and patterns of alcohol consumption in the United States (e.g Caetano, 1991; Cahalan et al., 1969; Clark and Hilton, 1991; Dawson et al., 1995; Robbins, 1991; Wilsnack et al., 1986). There have also been a number of studies examining alcohol consumption among Whites, Blacks and Hispanics. However, this cross-ethnic research has been mostly cross-sectional with few trends (Caetano and Clark, 1998b; Caetano and Clark, 1999; Midanik and Clark, 1994) and longitudinal analyses (Caetano, 1997; Caetano and Kaskutas, 1995; Caetano and Kaskutas, 1996). In an effort to partially address this gap, this paper examines trends in volume of drinking (average number of drinks per month), frequency of drinking 5 or more drinks in a day and frequency of intoxication between 1992 and 2002 among Whites, Blacks and Hispanics. Data are from the 1991–1992 National Longitudinal Alcohol Epidemiologic Survey (NLAES) and the 2001–2002 National Epidemiologic Study on Alcohol and Related Conditions (NESARC) conducted by the National Institute of Alcohol Abuse and Alcoholism (NIAAA; Grant et al., 1994).

As a general initial background, U.S. per capita consumption of alcoholic beverages in gallons of ethanol for the period under focus is best represented by a “U” shaped curve. It decreased from 2.30 to 2.14 gallons between 1992 and 1997, rising after that and reaching 2.20 gallons per capita in 2002 (Lakins et al., 2008). In 2006, the last year for which data are available, per capita consumption in gallons of ethanol was 2.27. The absence of data on drinking for Blacks and Hispanics makes it difficult to gauge whether this trend of decline and rise is also applicable to these 2 large minority groups that together constitute almost a quarter of the country’s population.

The existing trends analyses of drinking in the U.S. population are fragmented because they examine different periods and different drinking behaviors. Studies examining trends in current drinking, weekly drinking and frequency of binge drinking (5 or more drinks at a sitting) from 1984 to 1990 (Midanik and Clark, 1994), or from 1984 to 1995 (Caetano and Clark, 1998b) showed decreases in all these behaviors among Whites, but not among Blacks and Hispanics. On the other hand, data from the National Household Survey on Drug Use and Health (NSDUH, formerly the NHSDA; Substance Abuse and Mental Health Services Administration, 1999) also for the period 1985–1995 show a decline in ‘current drinking’ and ‘frequent heavy drinking’ among all 3 ethnic groups. These differences in trends may be due to the differences in the time frame used to collect data, past 30 days in the NSDUH, past 12 months in other research. Midanik (1999) and Kerr et al. (2006) reported trends in drunkenness and “feeling the effects of alcohol” between 1979 and 1995, and from 1995 to 2005, respectively. Both showed an increase in reports of drunkenness but a decrease in the number of drinks necessary to be drunk to feel the effects of alcohol.

Recently, Grant et al. (2004) reported prevalence data for alcohol abuse and dependence among Whites, Blacks and Hispanics between 1992 and 2002 using the NLAES (1991–1992) and NESARC (2001–2002) data. The prevalence of alcohol abuse showed statistically significant increases for the 3 groups, but the rank order remained the same with Whites on top (3.33% to 5.10%), followed by Hispanics (2.52% to 3.97%) and Blacks (1.46% to 3.29%). The prevalence of dependence decreased for all 3 groups, but the change was significant among Whites (4.35% to 3.83%) and Hispanics (5.78% to 3.95%), not for Blacks (3.84% to 3.57%).

The first aim of this study is to examine trends in overall volume of drinking (average number of drinks per month), drinking 5 or more drinks in a single day and frequency of

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intoxication among Whites, Blacks and Hispanics between 1992 and 2002. The second aim of the study is to assess the sociodemographic predictors of volume of drinking, drinking 5 or more drinks in a single day and frequency of intoxication. In general, epidemiological studies in the U.S. general population have found that men, those who are younger, those who are single or divorced, those who are less educated and those who are unemployed report more drinking and more drinking of 5 or more drinks in a single day or at a sitting (Dawson et al., 1995; Hilton, 1987). This is also true of Blacks and Hispanics, although some studies have reported that the drop in volume of drinking and drinking 5 or more with age is not as abrupt among Hispanics as it is among Whites (Caetano and Clark, 1998a). In other words, Hispanic men in their thirties and forties maintain a relatively high volume of drinking and drinking 5 or more compared to White men in the same age group.

Because Whites are the majority population, trends in drinking in this group determine to a large extent the overall trend in drinking in the country, which is described above. Based on this trend, the expectation is that Whites' drinking for the period under analysis increased in terms of volume, frequency of drinking 5 or more and intoxication. In regard to Blacks and Hispanics, previous trend analysis (Caetano and Clark, 1998b; Midanik and Clark, 1994) would suggest that drinking in these groups was either stable or increased. The latter expectation is based on the increased risk that ethnic minority groups face regarding drinking and associated problems. These groups live in communities where alcohol availability is higher (Duncan et al., 2002) and where there is more exposure to outdoor alcohol advertising (Alaniz, 1998; Duncan et al., 2002; Gorman and Speer, 1997). They have also been the target of special advertising of higher alcohol content beverages (Alaniz et al., 1999; Alaniz and Wilkes, 1998) with fewer personal and community resources to respond to these challenges (Adler and Newman, 2002; Link and Phelan, 2005). Blacks and Hispanics are, therefore, more at risk to develop harmful patterns of alcohol consumption.

METHODS

Sample and Data Collection

Data come from the 1991–1992 National Longitudinal Alcohol Epidemiologic Survey (NLAES) and the 2001–2002 National Epidemiologic Study on Alcohol and Related Conditions (NESARC) conducted by the NIAAA (Grant et al., 1994). Fieldwork for the NLAES and the NESARC was conducted by the United States Census Bureau. Respondents were selected at random from the U.S. household population 18 years of age and older with multistage cluster sampling procedures. Both surveys collected data during face-to-face interviews conducted in respondents' homes by trained interviewers using a standardized questionnaire. Thus, both surveys employed the same overall methodology, which makes trends analysis and comparison of data across the 2 surveys possible. The NLAES interviewed 42,862 respondents, including an oversample of Blacks and of respondents between 18 and 29 years of age. Hispanics were not oversampled, but because of the large sample in the NLAES (n = 2,800 for the total number of Hispanics interviewed) it is sufficient for the analysis in this paper. The target population for the NLAES was the non-institutionalized household population in the 48 contiguous United States. Hawaii and Alaska were excluded from the sampling frame. The NESARC interviewed 43,093 individuals, including an oversample of Blacks and Hispanic respondents. The target population for the NESARC also was the non-institutionalized household population, including Alaska and Hawaii. Additionally, non-institutional group quarters housing units (e.g., boarding/rooming houses, non-transient hotels/motels, shelters and facilities for housing workers, college quarters and group homes) were also sampled. Because the NLAES did not cover Alaska and Hawaii, this study excluded the population of Hawaii and Alaska from the NESARC data to enhance the comparability of the datasets.

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In the NLAES survey, the household response rate was 92% and the sample person response rate was 98%, for an overall survey response rate of 90%, whereas in the NESARC, the household response rate was 89%, the person response rate was 93% and the overall survey response rate was 81%. Hispanic respondents preferring to have their interviews conducted in Spanish were interviewed by specially trained interviewers.

Measures

The NLAES and the NESARC questionnaires employed the same questions to collect data on the several areas described below. Thus, strictly comparable measures of drinking status, alcohol consumption, intoxication, as well as measures of ethnic identification and sociodemographic characteristics can be created for comparisons across the 2 surveys.

Alcohol variables—*Drinking status*. Current drinkers are those respondents who had at least 12 drinks of any kind of alcohol in the past year. Respondents who did not have 12 drinks in the past year or never had any kind of alcohol in their lifetime were grouped as non-drinkers. A drink was defined in both surveys as containing 0.60 ounces of ethanol. *Mean number of drinks per month*. This is the total volume of beer, wine and liquor consumed in the past 12 months in number of drinks divided by 12. For each specific beverage, volume was computed by multiplying the number of drinks consumed per occasion by the frequency with which the specified number of drinks was consumed. Totals for each beverage were summed and divided by 12 to estimate the average number of drinks consumed per month. *Frequency of drinking 5 or more drinks in a day*. This is the frequency with which respondents had 5 or more drinks in a single day during the past 12 months. The original 11 response categories, ranging from every day to never in the last year were collapsed into a a 5-level variable—once a week or more, 1 to 3 times a month, less than once a month, did not drink 5 or more drinks in a single day, and ex-drinkers/abstainers. *Drinking to intoxication*. Respondents were asked to indicate how often they drank enough to feel intoxicated (i.e., drank enough to feel drunk- speech was slurred, felt unsteady on feet, or had blurred vision) in the past 12 months. The original 11 response categories, ranging from every day to never in the last year were collapsed to a 5-level variable—once a week or more, 1 to 3 times a month, less than once a month, did not drink to intoxication, and ex-drinkers/abstainers.

Results for test-retest reliability of alcohol measures assessing average daily intake, days per year drank usual quantity, quantity consumed per occasion and typical size of beverage consumed in the AUDADIS range from .70 to .99. (Grant et al., 1995).

Demographic variables—*Age*. Respondents reported their age in years as of the interview day. Based on this information, respondents were grouped into 5 categories: 18–29, 30–39, 40–49, 50–59 and 60 years or older (reference group). *Race/ethnicity*. Self-reported race/ethnicity data were used. The race/ethnicity variable has the following 3 categories: White, non-Hispanic; Black, non-Hispanic; and Hispanic, of any race. *Marital status*. The self-reported current marital status has 6 categories: never married, widow, divorced, separated, living with someone and married (reference group). *Place of birth*. Depending on the place of birth, respondents were categorized as U.S.-born if they were born in the U.S. and foreign-born if they were born outside the U.S. including territories (e.g. Puerto Rico). *Education*. Respondents reported the highest education grade completed. The original 14 categories were collapsed into 4 categories: less than high school, completed high school/GED, some college/technical education and completed a college degree or more (reference group). *Employment status*. This variable used respondents' current work status at the time of the interview. The original categories were collapsed into 5 categories: employed full- or part-time, unemployed, in school/other, homemaker (reference group) and retired.

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Family income. This variable represents annual family income. The original categories were re-grouped into 5 categories: less than or equal to $15K (reference group), $15,000 to $29,999, $30,000 to $49,999, $50,000 to $74,999, and more than or equal to $75K per year.
Survey year. The analysis herein uses a data set in which the 2 surveys were merged. Therefore, a separate variable (1=NLAES; 2=NESARC) was created to identify data from each of the 2 surveys.

Statistical Analysis

All analyses used the Software for the Statistical Analysis of Correlated Data (SUDAAN; Research Triangle Institute, 2005). Appropriate weights specification for each of the data sets was used. These weights corrected for oversampling, probability of selection at the household level, non-response and also adjusted the data to Census data. Chi-square test statistic and *t*-tests were used to identify differences in proportions and group mean differences in average number of drinks per month, respectively. The results of the cross-tabulations are reported in weighted proportions with corresponding unweighted sample sizes.

Sociodemographic predictors of the average number of drinks per month were examined with linear regression. Sociodemographic predictors of drinking 5 or more drinks in a single day and drinking to intoxication were examined with logistic regression. Four interaction effects were also examined in an effort to identify differences in trends across population subgroups: ethnicity by survey year, gender by survey year, birthplace by survey year and age by survey year. All main effects were entered simultaneously in the regression model. After that, one interaction effect was entered at a time in the model. The significance of each interaction contribution to the fit of the model was based on a likelihood ratio test. This test is obtained by multiplying the difference in log-likelihood for models with and without the predictor under test-2. This statistic follows a chi-square distribution with 1 degree of freedom. Non-significant changes in log-likelihood indicate that the fit of the model does not improve with the addition of the interaction, and thus the interaction may be dropped from the multivariate model.

If the interaction effect was significant, the interaction was retained in the model. The only exception to this rule was the interaction effect representing ethnicity by survey year. Given the importance of this variable to the analyses in this paper, results for this interaction effect are shown in each table independent of its contribution to the overall fit of the model. All variables in the analysis were categorical, with one specific category (identified in the table) serving as the reference category for estimation of the odds ratios.

RESULTS

Trends in Volume of Drinking (Mean Number of Drinks per Month)

Among both men and women, there were no statistically significant differences in the mean number of drinks per month for any of the 3 ethnic groups between 1992 and 2002 (data not shown). Among White men, the mean number of drinks per month was 21.3 in 1992 and 22.3 in 2002. Among Black men, the means were 19.8 and 18.9 for 1992 and 2002, respectively. For Hispanic men, the means were 18.5 and 17.8, respectively for 1992 and 2002. For women, the means for 1992 and 2002 were as follows: Whites, 6.2 and 6.2; Blacks, 4.9 and 5.2; Hispanics, 3.3 and 3.9.

Focusing on cross-ethnic differences within survey year, there were no statistically significant differences across White, Black and Hispanic men in 1992. In 2002, the mean number of drinks for White men was significantly higher than the mean for Black ($t = 2.62$, $p < .01$) and Hispanic ($t = 4.02$, $p < .000$) men. However, there was no significant difference

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between Hispanic and Black men. Among women, data for 1992 show a significant difference in mean number of drinks between Hispanic and Black women ($t = 2.66$, $p < .005$), and Hispanic and White women ($t = 6.51$, $p < .000$). Hispanic women's mean number of drinks was the lowest among all 3 ethnic groups. In 2002, Hispanic women's mean number of drinks was still the lowest among all 3 ethnic groups, and the difference between the mean for Hispanic and Black women, and Hispanic and White women was statistically significant (Hispanic vs. White, $t = 2.13$, $p < 0.05$; Hispanic vs. Black, $t = 5.13$, $p < 0.001$).

Trends in Current Drinking, Drinking 5 or More Drinks and Intoxication

Among men, there was a statistically significant increase in the proportion of current drinkers for all 3 ethnic groups between 1992 and 2002 (Table 1). The increase in percentage points was similar for each of the 3 ethnic groups: 5 points among Whites, 6 among Blacks and 7 among Hispanics. As a result, both White and Hispanic men have rates of current drinkers in 2002 that are similar and higher than those for Blacks.

Among men, there are statistically significant differences in the distribution of the frequencies of drinking 5 or more drinks in a day for all 3 ethnic groups between 1992 and 2002. For instance, there was a higher proportion of men reporting this behavior once a week or more in 2002 compared to 1992. However, the proportion of drinkers who do not report drinking 5 or more in a day was higher in 2002 than 1992. This increase was larger for Whites and Blacks (10 and 13 percentage points, respectively) than for Hispanics (9 percentage points).

The pattern of variation in drinking to intoxication between 1992 and 2002 has differences and similarities with that seen for drinking 5 or more drinks. First, the distribution of White, Black and Hispanic men across the 5 categories of drinking to intoxication in Table 1 changed significantly from 1992 to 2002. However, in contrast to data on drinking 5 or more, the proportion in each frequency category of intoxication was more stable. Thus, the overall proportion of men reporting intoxication is the same in 1992 and 2002 for Whites (29% and 30%), Blacks (21% to 22%) and Hispanics (26% and 25%).

Among women, there also was a statistically significant increase in the proportion of current drinkers in all 3 ethnic groups. About a third of Black and Hispanic women were drinkers in 2002, compared to almost half of the White women. Variations in the frequency of drinking 5 or more drinks in a day between 1992 and 2002 were also significant for all 3 ethnic groups. As with men, there were differences in the proportion of White, Black and Hispanic women who drink but do not report consuming 5 or more drinks in a day, which increased in all 3 groups. However, this increase was not because the overall proportion of drinkers who report drinking 5 or more decreased, but because the proportion of ex-drinkers and abstainers declined. The overall proportion of drinkers reporting drinking 5 or more among women declined among Whites (16% to 12%) and Blacks (8% to 6%) but was relatively stable among Hispanics (10% and 9%). In all 3 ethnic groups, variations in the frequency of drinking to intoxication in each specific frequency category from 1992 to 2002 were relatively small. Differences between 1992 and 2002 showed a general increase in reporting of intoxication. While trends across survey years were relatively similar for each ethnic group, both in 1992 and 2002, a higher proportion of White women than Black and Hispanic women drank 5 or more or drank to intoxication.

Sociodemographic Predictors of the Mean Number of Drinks per Month

Multiple linear regression was used to identify the sociodemographic predictors of monthly alcohol consumption (Table 2). First, the analysis tested an interaction effect between ethnic group and survey year. Compared to Whites in the NLAES, Blacks in the NLAES and in the

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NESARC consumed a lower mean number of drinks per month. Regardless of survey year, Hispanics' volume of drinking was not significantly different from Whites in the NLAES. However, Whites increased their mean consumption from NLAES to NESARC. Other predictors of consuming a higher mean number of drinks per month were gender (male), place of birth (U.S.-born), age (younger than 60), educational level (lower than being a college graduate), unemployment and not being married, that is, living with someone, being a widower, being divorced, being separated and having never married.

A regression analysis focusing on Whites only was conducted to assess whether the increase in volume of drinking between 1992 and 2002 had been larger among men, among specific age groups (18–29, 30–39, 40–49, 50–59 and 60+) and among those born in the U.S. compared to those born abroad (results not shown). The variables in this regression were the same as those in Table 2. Three interaction effects were tested one at a time: gender and survey year, age and survey year, and birthplace and survey year. Results indicated that no interaction effects were present. None of the interactions provided a significant contribution to the fit of the model.

Sociodemographic Predictors of Drinking 5 or more Drinks

This analysis was conducted in 2 steps: First, logistic regression analysis was used to test the association between selected sociodemographic variables and frequency of drinking 5 or more drinks in a day in the past 12 months (all who had 5 or more drinks in a day in the past 12 months compared to those who did not have 5 or more drinks in a day in the past 12 months, plus ex-drinkers and lifetime abstainers). None of the interactions tested (ethnicity by survey year, gender by survey year, birthplace by survey year and age by survey year) contributed significantly to the model. Table 3 shows all main effects and the interaction effect of ethnicity by survey year because of its importance to the analysis in this paper. Results indicate that Blacks and Hispanics in the NLAES and in the NESARC, as well as Whites in the NESARC, were less likely than Whites in the NLAES to report drinking 5 or more drinks (Table 3). Gender (male), place of birth (U.S.-born), age (younger than 60), level of education (high school diploma/GED or some college/technical education), having an income equal to or higher than $50,000/year, being employed or unemployed, and living with someone or not being in a relationship, with the exception of being widowed, were all predictors of drinking 5 or more drinks.

In the second step of this analysis, and because results in Table 1 show an increase in the frequency of drinking 5 or more drinks in a day in the top most frequency category, logistic regression was used to identify the predictors of drinking 5 or more drinks in a day at least once a month (Table 3). The analysis was conducted only on respondents who reported drinking 5 or more drinks in a day in the past year and the reference group were drinkers who drank 5 or more drinks in a day less than once a month. None of the interaction effects tested contributed significantly to the fit of the model. However, this analysis shows that Blacks in the NLAES were more likely than Whites in the NLAES to drink 5 or more drinks in a day at least once a month. Whites, Blacks and Hispanics in NESARC were more likely to report this behavior at least once a month than Whites in the NLAES. Other predictors were being a male, being U.S.-born, having an educational level lower than college graduate, having an income equal to or higher than $15,000 per year, and living with someone or being divorced, separated or never married.

Sociodemographic Predictors of Intoxication

As in the analysis of drinking 5 or more drinks in a day, the analysis of predictors of drinking to intoxication was also implemented in 2 steps. First, logistic regression was used to assess the association between selected sociodemographic factors and drinking to

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intoxication at least once in the past 12 months (compared to those reporting no intoxication in the past 12 months; see Table 4). Results indicate that Blacks and Hispanics in the NLAES and in the NESARC were less likely than Whites in the NLAES to report drinking to intoxication. On the other hand, Whites in the NESARC were more likely than Whites in the NLAES to report intoxication. Other predictors of drinking to intoxication at least once in the past 12 months are gender (male), being older than 18 years old (with the exception of 50–59), having an annual income equal to or higher than $50,000, being employed or unemployed, and living with someone or being divorced, separated or never married.

In a second step, and also because of the increase in the proportion of respondents reporting intoxication once a week or more in Table 1, logistic regression was used to identify the predictors of reporting intoxication more than once a month in the past 12 months (Table 4). This analysis was conducted with respondents who reported intoxication at least once in the past 12 months. Results show that Blacks in the NLAES and Blacks and Whites in the NESARC are more likely than Whites in the NLAES to report getting intoxicated more than once a month. The interaction effect of age by survey year contributed significantly to the fit of the model. Compared to those 60 years of age and more in the NLAES, all age groups in the NESARC are more likely to report intoxication more than once a month. In addition, male gender, an educational level below college graduate, and being divorced, separated or never married are risk factors for getting intoxicated more than once a month. Any level of income equal to or above $15,000 a year is a protective factor.

DISCUSSION

Trends in Volume of Drinking

The trends described in this paper show a complex picture of similarities and differences in volume of drinking between 1992 and 2002 for the 3 ethnic groups under study. First, the mean number of drinks consumed in 1992 was not different from that consumed in 2002 for any of the groups, independent of gender. However, because Black and Hispanic men decreased the mean number of drinks between 1992 and 2002 while White men did not, comparisons within surveys show differences across ethnic groups in 2002 but not in 1992. In 2002, White men have a higher mean consumption than Blacks and Hispanics. Among women, the differences across ethnic groups in 1992 are the same in 2002, and White women also have a higher mean consumption than Black and Hispanic women. The results in regression analysis in Table 2 are different in that there is a positive and statistically significant effect for the interaction between White ethnicity and survey year (2002). In other words, the trend in volume of drinking for Whites was different from the trend for Blacks and Hispanics: volume went up for Whites but was either stable or went down for Blacks and Hispanics. Also, given that the effect of sociodemographic factors is controlled for in the regression analysis, the higher mean number of monthly drinks for Whites in 2002 cannot be attributed to the social or demographic factors controlled for in the analysis. However, there are many uncontrolled variables that could still influence the results. Also, the issue is made more complex by the fact that a given variable under consideration in the analysis could have different effects on drinking across ethnic groups. For instance, and as mentioned in the introduction to this paper, age is associated with a strong and abrupt decline in drinking among Whites. However, age's effect on drinking among Hispanics does not seem to be associated with such a strong decline in drinking after the twenties (Caetano and Clark, 1998a).

Because there have been no other cross-ethnic trend analysis for drinking for the same time period, it is not possible to compare these results with others in the literature. U.S. general population trend data for other periods have in general suggested stability of drinking over time (see for example, Clark and Midanik, 1982; Hilton, 1991d; Johnson et al., 1977). More

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recently, there have been reported reductions in the proportion of current drinkers and weekly drinking from 1984 to 1990 mostly for Whites, with no significant trends for Blacks and Hispanics (Midanik and Clark, 1994). Data on per capita consumption in the U.S. for the time period 1992–2002, the period under focus, show a decline and then a rise in per capita consumption (Lakins et al., 2008). As a result, U.S. per capita consumption in gallons of ethanol for the population 14 years of age and older was relatively similar in 1992 and 2002: 2.3 gallons per capita in 1992 and 2.2 in 2002. The survey data on mean number of drinks consumed per month thus are in good agreement with this backdrop of U.S. per capita consumption. The trouble is that in contrast with the relative stability in mean number of drinks, the proportion of current drinkers rose among both men and women in all 3 ethnic groups. Thus, the survey data indicate that there are more drinkers in the population, but this rise in the proportion of drinkers does not seem to be triggering a rise in the mean number of drinks consumed per month, at least among Blacks and Hispanics. Such rise could happen because, in general, drinkers have more liberal norms and attitudes toward alcohol consumption than abstainers (Caetano and Clark, 1998b), which could lead to an overall liberalization of attitudes toward drinking at the population level and an increases in the mean number of drinks consumed per month.

Results from the regression are not surprising, and replicate previous findings in the literature (Hilton, 1991c). This provides, among other things, an indication that the predictors, the sociodemographic variables and the alcohol outcomes as measured in the 2 surveys under analysis replicate well other previous measures of the same characteristics in the literature. Male gender, not being married or not living with someone, U.S. birth, lower educational level and unemployment are associated with a higher level of alcohol consumption, as they have been in previous studies (Hilton, 1991a; Hilton, 1991b; Midanik and Clark, 1994). Men and those who are single usually have more liberal attitudes towards drinking. Those who are born in the U.S. may have more disposable income to purchase alcoholic beverages than the foreign-born. Unemployment may be associated with higher levels of stress and, thus, alcohol could be used as a coping factor. It is also important to recognize that there may be variations within these sociodemographic groups that are not captured by the manner in which the sociodemographic variables were measured. For instance, existing evidence indicates variation in overall volume of drinking and binge drinking across Hispanic national groups, which is not captured by grouping all Hispanics together. Similarly, there may be variations across subgroups of those who are employed (e.g., white versus blue collar) that are not captured by the measurement used in this paper.

Trends in Drinking 5 or More Drinks

Data in Table 1 are indicative of a decrease in the proportion of respondents reporting drinking 5 or more drinks in a day in all ethnic groups and in both genders between 1992 and 2002. This seems to be because in spite of the increase in the proportion of drinkers, a larger proportion of drinkers do not report drinking 5 or more drinks in a day. Results from the crosstab and the logistic regression in Table 3 show that indeed all ethnic groups in the NESARC are less likely than Whites in the NLAES to report drinking 5 or more drinks. However, results in the crosstab and in the logistic regression in Table 3 also show that drinkers who report drinking 5 or more drinks in a day were more likely to report doing so at least once a month in NESARC than in NLAES, independent of ethnicity. All other things being equal, and given that drinking 5 or more drinks is a strong predictor of alcohol-related problems, abuse and dependence, the benefits from an overall decrease in this type of drinking in the population should be seen across Whites, Blacks and Hispanics, unless the benefits were offset by the increase in the proportion of drinkers drinking 5 or more at least once a month. Data from the 2 surveys analyzed herein can be used to gauge the extent to which the decrease in the consumption of 5 or more drinks has had an impact on the

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prevalence of abuse and dependence. Indeed, from 1992 to 2002, the prevalence of alcohol dependence declined in the 3 groups. The decline in prevalence was higher among Hispanic men (9.4% to 5.9%) than among White (6.1 % to 5.4%) and Black (5.8% to 5%) men. However, there also was an increase in the prevalence of alcohol abuse.

Regarding the association of sociodemographic factors with the 2 outcomes in Table 3, age and income are risk factors for drinking 5 or more in a day at least once a year, while income, but not age, predicts drinking 5 or more in a day at least once a month. The most likely explanation for this difference in results is that the analysis of 5 or more drinks in a day at least once a year is based on data for the whole sample. The second analysis includes only drinkers who reported drinking 5 or more drinks in a day at least once a year. Thus, the second analysis is conducted with a sample subgroup with a higher proportion of men and younger respondents. This is a more uniform group, with a narrower age range, which probably makes age less relevant in determining drinking pattern. Income remains a factor of risk because those with more disposable income can spend more purchasing alcohol and may also have a lifestyle that includes more frequent presence in social occasions where alcohol is consumed (e.g., going out more to drink with friends at bars and restaurants).

Other trend analyses of U.S. general population data for other periods have also shown different results for trends in drinking 5 or more depending on the period of analysis. Hilton (1991d) did not detect any increase in drinking 5 or more between 1967 and 1984, but Hilton reported an increase in weekly drinking of 5 or more for both men and women between 1979 and 1984. Perhaps of more interest to the present analyses are the trends reported by Midanik and Clark (1994) and Caetano and Clark (1998b) for Whites, Blacks and Hispanics. Both these analyses did not find uniform trends across these 3 ethnic groups: the trend among Whites showed a decrease and the trend among Blacks and Hispanics showed stability in drinking 5 or more drinks. Interestingly, these past trends were not linked to a decrease in problem prevalence among Whites, Blacks or Hispanics (Caetano and Clark, 1998b; Grant et al., 2004; Midanik and Clark, 1995).

Trends in Intoxication

Crude rates of intoxication were more stable than crude rates for drinking 5 or more drinks across ethnic groups and gender. This is somewhat surprising because rates of intoxication are based on reports that are more subjective than reports of 5 or more drinks, given that the meaning of intoxication is not defined for respondents. Thus, they would be expected to vary more, but this is not the case with data from the 2 surveys analyzed herein. The regression analysis shows that Whites in 2002 are more likely to report intoxication than Whites in 1992. Also, among drinkers who get intoxicated, drinkers in the NESARC were more likely than those in the NLAES to report getting intoxicated more than once a month, independent of ethnicity. This finding is consistent with that for consuming 5 or more drinks in a day, discussed above. This finding was also present across all age groups in the NESARC compared to the group 60 years of age and older in the NLAES.

There are no other findings in the literature to use as a comparison. Heavy drinking occasions have been associated with an increased risk for both acute and chronic alcohol-related problems, as well as mortality (Midanik, 1999; Rehm et al., 2006; Rehm et al., 2001; Stockwell et al., 1996). However, most papers addressing this issue do not use respondents' subjective assessment of intoxication as an indicator of heavy drinking, but assess such drinking by asking for occasions in which a large number of drinks were consumed, usually 5 or more drinks. An exception is Midanik's (1999) analysis of frequency of intoxication and problems showing a positive association between drunkenness and the risk of social consequences from drinking and alcohol dependence. Another exception is Greenfield and Kerr's (2008) discussion of specific advantages and disadvantages of a subjective measure

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of intoxication, which proposes that a subjective measure of drunkenness and objective measures of heavier drinking contribute independently to the prediction of problems. Building on this previous work, Mulia et al. (2009) included a measure of subjective intoxication together with a measure of drinking 5 or more drinks in a day and maximum amount in a day to build a composite measure of heavy drinking. The measure showed a strong association with social consequences from drinking and dependence symptoms across Whites, Blacks and Hispanics.

All other things being equal, the fact that Whites and Blacks in NESARC-2002 are more likely to report intoxication compared to NLAES-1992 puts these 2 groups at an increased risk for alcohol problems vis-a-vis Hispanics. However, the relationship between alcohol consumption and problems is complex, being influenced by the drinker's social, familial and financial resources. For instance, Blacks and Hispanics are more likely than Whites to report social consequences from drinking, even after controlling for the contribution of heavy drinking (Mulia et al., 2009). Thus, inconsistent findings between trends in alcohol consumption and alcohol problems are not uncommon.

Strengths and Weaknesses

Both the NLAES and the NESARC are large household population surveys that achieved outstanding response rates. Results from these 2 surveys are generalizable to the U.S. population and the ethnic groups under focus. The data were collected in face-to-face interviews with a standardized questionnaire, which allowed for detailed collection of information on drinking. Black respondents were oversampled in the NLAES and both Black and Hispanic respondents were oversampled in the NESARC. The surveys also have a few limitations. The consumption of 5 or more drink in a day does not fully conform to the NIAAA proposed definition of binge drinking, which specifies 5 or more for men and 4 or more for women in a period of 2 hours. Also, it is well known that survey respondents have a tendency to underreport their alcohol consumption. While there is still considerable discussion about whether such underreporting affects some types of drinkers more than others (dfferential bias), given the concentrated nature of alcohol consumption in the U.S. (the top 5% drinkers consume 40% of all self-reported alcohol), the likelihood is that heavier drinkers would underreport more than lighter drinkers (Greenfield and Rogers, 1999; Greenfield, 1998). There also were some slight variations in data collection that could have affected the comparison of results across surveys. Finally, there are limitations in the analysis implemented. While the regression analyses controls for some of the sociodemographic variables that can affect drinking, other variables with potential to affect drinking were not included in the analysis (e.g., attitudes towards drinking, alcohol expectancies).

Conclusions

Trends in overall volume of drinking, drinking 5 or more drinks in a day and getting intoxicated varied across ethnic groups. As a result of ethnic-specific changes in mean number of drinks between 1992 and 2002, Whites in 2002 have a higher mean number of drinks than Blacks and Hispanics. Regarding drinking 5 or more drinks in a day, there was a significant increase between 1992 and 2002 in this drinking behavior at least once a month in all 3 ethnic groups. Regarding intoxication, more Whites reported intoxication in 2002 than 1992. More Blacks reported intoxication in 2002 than 1992 but this was only for the group reporting this state at least once a month. There was no significant trend in reports of intoxication among Hispanics. These results suggest a polarization in drinking between the 2 surveys under analysis, especially regarding drinking 5 or more drinks. If polarization has occurred, it is important to know that alcohol consumption in the U.S. population is highly concentrated in a relatively small group of drinkers. In the U.S., the top 5% of the drinkers

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consume about 40% of the alcohol (Greenfield and Rogers, 1999). Increased polarization could mean that a smaller proportion of drinkers would become the source of an increased proportion of alcohol-related problems at the population level. This would, in turn, reinforce the need for the adoption of a diversity of public health policies, some directed at this group of heavier drinkers (e.g. treatment, brief intervention), others directed at all drinkers (e.g., taxation, control in hours of sale).

Finally, detecting ethnic-specific trends in alcohol consumption is not surprising, given that they had been detected in previous research with the U.S. general population. Ethnicity is, therefore, a factor that contributes to the pattern with which alcoholic beverages are consumed and to trends in consumption. Continuous monitoring of alcohol consumption levels is necessary to increase understanding of the factors that modulate consumption as well as to detect as early as possible signs of an increase in patterns of risky drinking (binge, intoxication) in the population.

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Table 1

Current drinkers, frequency of drinking 5 or more drinks in a day and frequency of intoxication among Whites, Blacks and Hispanics by gender and survey year (NLAES, 1992 – NESARC, 2002).

Males		**White**		**Black**		**Hispanic**	
		1992	**2002**	**1992**	**2002**	**1992**	**2002**
Drinking status €	Current drinkers (n)	58.31 (7937)	63.52 (6885)	46.56 (967)	52.50 (1554)	52.95 (635)	60.28 (2281)
5+ Drinks in a day (N)		**(13538)**	**(10782***)**	**(2091)**	**(3025***)**	**(1191)**	**(3700***)**
	Once a week or more	9.21	13.55	9.64	11.39	9.83	14.05
	1–3 times a month	9.22	6.99	6.84	3.64	10.95	9.34
	< Once a month	18.72	11.50	11.53	5.79	16.77	11.86
	Drinker/ No 5+ drinks	20.96	31.27	18.28	31.45	15.32	24.56
	Ex-drinkers/Abstainers	41.90	36.68	53.72	47.74	47.13	40.19
Drinking to intoxication (N)		**(13555)**	**(10766***)**	**(2094)**	**(3023**)**	**(1192)**	**(3698**)**
	Once a week or more	2.69	5.19	3.18	4.38	2.76	4.33
	1–3 times a month	5.41	5.09	4.16	4.86	5.19	4.53
	< Once a month	20.98	20.29	13.70	12.72	18.59	16.39
	Drinker/ No intoxication	29.07	32.70	25.24	30.32	26.34	34.54
	Ex-drinkers/Abstainers	41.84	36.72	53.72	47.72	47.12	40.21
Females		**White**		**Black**		**Hispanic**	
		1992	**2002**	**1992**	**2002**	**1992**	**2002**
Drinking status €	Current drinkers (n)	37.69 (6848)	46.98 (6321)	21.26 (871)	30.31 (1507)	23.78 (411)	31.67 (1473)
5+ Drinks in a day (N)		**(18295)**	**(13631***)**	**(3850)**	**(5194***)**	**(1617)**	**(4576***)**
	Once a week or more	2.16	3.22	2.41	2.33	1.16	2.56
	1–3 times a month	3.40	2.91	2.44	1.30	2.05	2.18
	< Once a month	10.49	6.24	3.47	2.25	7.01	4.24
	Drinker/ No 5+ drinks	21.52	34.49	12.83	24.32	13.45	22.55
	Ex-drinkers/Abstainers	62.44	53.15	78.85	69.80	76.33	68.48

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Males		White		Black		Hispanic	
		1992	2002	1992	2002	1992	2002
Drinking to intoxication (N)		**(18303)**	**(13618***)**	**(3851)**	**(5192***)**	**(1618)**	**(4573***)**
	Once a week or more	0.75	1.73	0.82	1.59	0.38	1.31
	1–3 times a month	1.93	2.66	1.35	2.06	1.25	1.93
	< Once a month	12.88	15.18	4.57	6.67	8.08	8.74
	Drinker/ No intoxication	22.02	27.23	14.44	19.85	14.00	19.55
	Ex-drinkers/Abstainers	62.42	53.20	78.82	69.82	76.29	68.47

Notes: Proportions and means are weighted; numbers in parentheses reflect current drinker sample size;

** p<.01,

*** p<0.001 (indicates significant difference between survey years within the given ethnic group);

€ Significant between ethnic groups within survey years.

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Table 2

Unstandardized regression coefficients from multivariate regression model predicting volume of drinking – NLAES-NESARC merged surveys (N=65958).

	Estimate	Standard Error	95% CI
Race and survey year (Ref: White/NLAES)			
Black/NLAES	−2.96**	0.94	−4.84—(−1.08)
Hispanic/NLAES	−1.78	1.00	−3.78—0.22
Hispanic/NESARC	−1.18	0.70	−2.57—0.21
Black/NESARC	−2.51***	0.65	−3.81—(−1.21)
White/NESARC	1.74***	0.48	0.77–2.71
Male (Ref: Female)	15.08***	0.44	14.21–15.96
U.S.-born (Ref: Foreign-born)	5.27***	0.49	4.29–6.25
Age (Ref: 60+)			
18–29	5.08***	0.62	3.84–6.32
30–39	4.34***	0.58	3.19–5.49
40–49	3.94***	0.56	2.81–5.06
50–59	2.14***	0.59	0.97–3.32
Education level (Ref: College graduate)			
< High school	2.94***	0.70	1.55–4.34
High school diploma/GED	2.41***	0.48	1.44–3.37
Some college/Technical	1.10*	0.44	0.22–1.97
Income (Ref: < $15,000)			
$15,000–29,999	−0.57	0.60	−1.77—0.62
$30,000–49,999	−0.50	0.68	−1.86—0.85
$50,000–74,999	−0.95	0.67	−2.28—0.38
≥ $75,000	−0.99	0.70	−2.39—0.41
Employment status (Ref: Homemaker)			
Retired	−0.73	0.59	−1.90—0.44
Unemployed	2.54*	1.04	0.46–4.61
In school/Other	−0.05	0.99	−2.02—1.92
Employed	0.61	0.49	−0.36—1.58
Marital status (Ref: Married)			
Living with someone	9.21***	1.36	6.50–11.92
Widowed	1.67***	0.48	0.71–2.63
Divorced	7.77***	0.93	5.91–9.63
Separated	9.69***	1.91	5.88–13.50
Never married	4.63***	0.61	3.42–5.85

Notes:

* $p < 0.05$,

** p<0.01,

*** p<0.001;

The reference group is the “no” category which includes ex-drinkers and lifetime abstainers.

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Table 3

Odds ratios and 95% confidence intervals from the logistic regression analysis predicting drinking 5 or more drinks in a day among Whites, Blacks and Hispanics.

	Had 5 or more drinks in a day in past 12 months (N=65761)[$]		Had 5 or more drinks in a day at least once a month (N=13029)[$$]	
	OR	**95% CI**	**OR**	**95% CI**
Race and survey year (Ref: White/NLAES)				
Black/NLAES	0.44***	0.38–0.50	1.42**	1.13–1.78
Hispanic/NLAES	0.83*	0.71–0.98	1.11	0.85–1.44
Hispanic/NESARC	0.74***	0.66–0.83	1.95***	1.64–2.32
Black/NESARC	0.32***	0.29–0.36	2.33***	1.90–2.84
White/NESARC	0.81***	0.76–0.87	2.05***	1.84–2.29
Male (Ref: Female)	3.75***	3.54–3.96	1.99***	1.81–2.19
U.S.-born (Ref: Foreign-born)	1.66***	1.49–1.84	1.32**	1.09–1.60
Age (Ref: 60+)				
18–29	8.40***	7.52–9.39	1.02	0.82–1.26
30–39	6.07***	5.42–6.79	0.99	0.80–1.22
40–49	3.93***	3.50–4.41	1.00	0.80–1.25
50–59	2.39***	2.12–2.70	1.07	0.84–1.35
Education level (Ref: College graduate)				
< High school	1.10	0.99–1.22	2.73***	2.32–2.24
High school diploma/GED	1.16***	1.07–1.26	1.96***	1.73–2.23
Some college/Technical	1.22***	1.12–1.32	1.44***	1.27–1.64
Income (Ref: < $15,000)				
$15,000–29,999	1.04	0.96–1.12	0.83*	0.72–0.96
$30,000–49,999	1.07	0.98–1.17	0.79**	0.67–0.92
$50,000–74,999	1.11*	1.01–1.22	0.77**	0.65–0.91
≥ $75,000	1.27***	1.15–1.41	0.66***	0.56–0.78
Employment status (Ref: Homemaker)				
Retired	1.01	0.89–1.14	1.04	0.85–1.28
Unemployed	1.17*	1.02–1.35	9.05	0.82–1.33
In school/Other	1.02	0.87–1.19	1.05	0.80–1.37
Employed	1.22***	1.11–1.35	0.97	0.82–1.16
Marital status (Ref: Married)				
Living with someone	2.23***	1.95–2.55	1.34**	1.10–1.63
Widowed	1.02	0.84–1.23	1.33	0.93–1.90
Divorced	1.83***	1.67–1.99	1.38***	1.19–1.60
Separated	1.85***	1.59–2.15	1.93***	1.49–2.49

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	Had 5 or more drinks in a day in past 12 months (N=65761)[$]		Had 5 or more drinks in a day at least once a month (N=13029)[$$]	
	OR	**95% CI**	**OR**	**95% CI**
Never married	1.41***	1.31–1.51	1.69***	1.51–1.90

Notes:

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$;

[$] The denominator includes the whole sample and the reference group is the "no" category which includes current drinkers who did not do 5 or more drinks in a day, ex-drinkers and lifetime abstainers;

[$$] The denominator includes current drinkers who reported drinking 5 or more drinks in a day at least once in the past 12 months and the reference group is the group that drinks 5 or more drinks in a day less than once a month.

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Table 4

Odds ratios and 95% confidence intervals from logistic regression analysis predicting intoxication among Whites, Blacks and Hispanics

	Drank to intoxication in past 12 months (N=65746)$		Drank to intoxication at least once a a month in past 12 months (N=12914)$$	
	OR	**95% CI**	**OR**	**95% CI**
Race and survey year (Ref: White/NLAES)				
Black/NLAES	0.42***	0.36–0.48	1.57**	1.18–2.08
Hispanic/NLAES	0.83*	0.70–0.99	0.97	0.69–1.36
Hispanic/NESARC	0.86*	0.76–0.99	1.59	0.93–2.74
Black/NESARC	0.57***	0.52–0.64	2.08*	1.20–3.61
White/NESARC	1.30***	1.21–1.40	1.73*	1.03–2.91
Age (Ref: 60+)				
18–29	11.41***	11.41***	n/a	n/a
30–39	7.29***	7.29***	n/a	n/a
40–49	4.48***	4.48***	n/a	n/a
50–59	2.43	2.43	n/a	n/a
Age and survey year (Ref: 60 +/NLAES)				
18–29/NLAES	n/a	n/a	1.54	0.94–2.51
30–39/NLAES	n/a	n/a	1.16	0.71–1.89
40–49/NLAES	n/a	n/a	1.24	0.71–2.18
50–59/NLAES	n/a	n/a	1.25	0.70–2.23
18–29/NESARC	n/a	n/a	3.28***	1.95–5.14
30–39/NESARC	n/a	n/a	2.25**	1.34–3.79
40–49/NESARC	n/a	n/a	2.20**	1.29–3.74
50–59/NESARC	n/a	n/a	2.08*	1.20–3.62
60 +/NESARC	n/a	n/a	4.49***	2.55–7.90
Male (Ref: Female)	2.13***	2.01–2.25	1.87***	1.68–2.08
U.S.-born (Ref: Foreign-born)	1.92***	1.72–2.16	0.80	0.63–1.02
Education level (Ref: College graduate)				
< High school	0.71***	0.64–0.79	1.89***	1.57–2.28
High school diploma/GED	0.81***	0.75–0.81	1.43***	1.23–1.65
Some college/Technical	0.97	0.90–1.04	1.25**	1.08–1.45
Income (Ref: < $15,000)				
$15,000–29,999	1.01	0.93–1.10	0.78**	0.67–0.91
$30,000–49,999	1.08	0.99–1.18	0.71***	0.61–0.82
$50,000–74,999	1.14*	1.04–1.25	0.58***	0.49–0.69
≥ $75,000	1.42***	1.28–1.58	0.55***	0.46–0.65

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	Drank to intoxication in past 12 months (N=65746)$		Drank to intoxication at least once a a month in past 12 months (N=12914)$$	
	OR	**95% CI**	**OR**	**95% CI**
Employment status (Ref: Homemaker)				
Retired	1.06	0.94–1.19	0.92	0.71–1.19
Unemployed	1.30***	1.14–1.49	0.87	0.66–1.14
In school/Other	1.15	0.99–1.33	1.00	0.75–1.32
Employed	1.27***	1.15–1.40	0.84	0.68–1.03
Marital status (Ref: Married)				
Living with someone	2.35***	2.08–2.66	1.17	0.95–1.45
Widowed	0.93	0.77–1.12	1.28	0.82–2.00
Divorced	1.82***	1.67–1.99	1.34**	1.12–1.61
Separated	1.85***	1.60–2.13	1.64**	1.25–2.15
Never married	1.42***	1.33–1.52	1.84***	1.60–2.13

Notes:

* p< 0.05,

** p<0.01,

*** p<0.001;

n/a = not applicable;

$ The denominator includes the whole sample and the reference group is the “no” category which includes current drinkers who did not drink to intoxication, ex-drinkers and lifetime abstainer;

$$ The denominator includes current drinkers who reported drinking to intoxication at least once in the past 12 months and the reference group is the “no” category which includes drinkers who drank to intoxication less than once a month.