Alcohol Consumption in Response to the COVID-19 Pandemic in the United States

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Objectives: Excessive alcohol use is a serious and growing public health problem. Alcoholic beverage sales in the United States increased greatly immediately after the stay-at-home orders and relaxing of alcohol restrictions associated with the COVID-19 pandemic. However, it is not known to what degree alcohol consumption changed. This study assesses differences in alcohol drinking patterns before and after the enactment of stay-at-home orders.
Methods: In May 2020, a cross-sectional online survey of 993 individuals using a probability-based panel designed to be representative of the US population aged 21 and older was used to assess alcohol drinking patterns before (February, 2020) and after (April, 2020) the enactment of stay-at-home orders among those who consumed alcohol in February, 2020 (n = 555). Reported differences in alcohol consumption were computed, and associations between differences in consumption patterns and individual characteristics were examined.
Results: Compared to February, respondents reported consuming more drinks per day in April (+29%, $P < 0.001$), and a greater proportion reported exceeding recommended drinking limits (+20%, $P < 0.001$) and binge drinking (+21%, $P = 0.001$) in April. These differences were found for all sociodemographic subgroups assessed. February to April differences in the proportion exceeding drinking limits were larger for women than men ($P = 0.026$) and for Black, non-Hispanic people than White, non-Hispanic people ($P = 0.028$).
Conclusions: There is an association among the COVID-19 pandemic, the public health response to it, changes in alcohol policy, and alcohol consumption. Public health monitoring of alcohol consumption during the pandemic is warranted.

The coronavirus disease 2019 (COVID-19) pandemic is an evolving global public health and economic crisis. In the United States, large-scale efforts began in March 2020 to reduce the burden of COVID-19. In contrast to the restrictions on alcohol availability enacted in several countries,[1] many states included restaurants and liquor stores as essential businesses and authorized off-premise alcohol deliveries, mixed drinks to go, and curbside pickup.[2]

Off-premise alcoholic beverage sales in the United States increased considerably after the stay-at-home orders and relaxing of alcohol restrictions. Retail sales for April increased by 14% from 2019 to 2020, and the 4 months following February 2020 represent the 4 largest year-over-year increases on record (since 1993).[3] However, changes in alcohol consumption have not yet been published. After the terrorist attacks of September 11, 2001,[4] and Hurricane Katrina,[5] there were sustained increases in alcohol consumption, prevalence of alcohol use disorders, binge drinking (defined throughout the study as consuming 5 or more drinks in a 2-hour period and 4 or more drinks in a 2-hour period, respectively, for men and women younger than age 65[6]), and alcohol-attributable violence and death. The weeks of isolation imposed by stay-at-home policies and the scale of the current pandemic are unmatched by recent disasters. Understanding the effects of the pandemic on drinking patterns may inform clinicians, policymakers, and public health specialists. This study assesses drinking patterns before and after stay-at-home orders and alcohol regulation modifications.

METHODS

Data Source

Between May 8 and 15, 2020, a cross-sectional online survey of alcohol drinking patterns was conducted using the Ipsos KnowledgePanel, a panel with more than 55,000 adults recruited using an addressed-based sampling methodology to be representative of the US population.[7] A random sample of 1691 panel members was identified using a weighted selection methodology, and 993 adults aged 21 and older (59%) completed the survey (see supplemental digital content [SDC] 1, http://links.lww.com/JAM/A225).

Measures

The survey (see SDC2, http://links.lww.com/JAM/A226) asked about alcohol consumption in April (after stay-at-home orders) and in February (before stay-at-home orders). Alcohol consumption measures included frequency and quantity of usual consumption; frequency and quantity of the largest amount consumed; and frequency of binge drinking. Additional measures were computed, including drinks per day, drinks per drinking day, and binary measures representing binge drinking and drinking in excess of recommended limits,[6] defined as consuming more than 4 drinks per day and 14 per week for men aged 18 to 64, and more than 3 per day and 7 per week for women and men aged 65 or older (see SDC1, http://links.lww.com/JAM/A225).

The survey also asked about mental health symptoms, employment status, and lifetime experiences with alcohol. Demographic characteristics of panel members were obtained from Ipsos.

Analysis

Poststratification weights provided by Ipsos were applied to reflect the US population. The main analysis focused on February drinkers and assessed reported differences in drinking patterns from February to April; a separate analysis was conducted for the full sample (see SDC3, http://links.lww.com/JAM/A227). Models were estimated on a 2-period panel to evaluate differences between February and April in 3 key measures: drinks per day, proportion exceeding drinking limits, and proportion binge drinking. A linear regression model was estimated for the drinks per day outcome, and logistic regression models were estimated for the proportion outcomes (see SDC1, http://links.lww.com/JAM/A225). Independent variables included demographic characteristics, an indicator for month, and interactions between demographic characteristics and month. Standard errors were clustered on the individual level. This study was deemed exempt by the authors' institutional review board.

RESULTS

Of 993 respondents, 555 (56%) reported drinking on at least 1 day in February after excluding 1 respondent who reported consuming 60 drinks per day in both months. Sample characteristics are shown in Table 1. Average drinks per day reported by respondents was 29% higher in April than February ($P < 0.001$). Reported risky drinking behaviors— exceeding drinking limits ($+20\%$, $P < 0.001$) and binge drinking ($+21\%$, $P = 0.001$)—also increased from February to April. Average drinking days and drinks per drinking day increased by 20% and 10%, respectively.

Figure 1 shows the levels in February and April of 3 outcomes—drinks per day, proportion exceeding drinking limits, and proportion binge drinking—over the whole analysis sample and by sex, age, and race/ethnicity. The level of all 3 outcomes increased between February and April for all demographic groups. For the drinks per day and binge drinking outcomes, there was no statistically significant association between the difference in the outcome and demographic characteristics. The increase in exceeding drinking limits was larger for women than men ($P = 0.026$) and for Black,

TABLE 1. Sample Characteristics

Characteristic	February	April
Observations	555	
Sex		
Female	52.34%	
Male	47.66%	
Age		
21–34	24.65%	
35–49	25.26%	
50–64	29.70%	
65 or older	20.39%	
Race/ethnicity		
White, non-Hispanic	65.66%	
Black, non-Hispanic	9.01%	
Other, non-Hispanic	6.77%	
Hispanic	18.55%	
Education		
High school diploma or less	29.61%	
Some college	29.84%	
Bachelor's degree or more	40.55%	
Annual household income		
Less than $50,000	22.83%	
$50,000 - $100,000	29.50%	
$100,000 or more	47.68%	
Unemployed	3.33%	6.59%
Average drinks per day	0.74 (1.19)	0.95 (1.41)
Average drinks per drinking day	2.47 (1.82)	2.72 (2.10)
Drinking days*	7.83 (7.96)	9.37 (8.95)
Usual quantity when drinking	2.19 (1.59)	2.19 (2.01)
Maximum quantity when drinking		
0–2	53.63%	48.80%
3–4	25.42%	27.70%
5–7	14.61%	15.82%
8 or more	6.34%	7.68%
Exceeded drinking limits†	30.11%	36.11%
Any binge drinking‡	23.39%	28.39%

Survey weights applied. Inclusion conditional on drinking on at least 1 day in February. Observations for individual items vary slightly due to item-level missing data.

*Frequency normalized to 30 days.

†More than 4 (for males) or 3 (for females) drinks in 1 day, or more than 14 (for males) or 7 (for females) drinks in 1 week.

‡Five (for males) or 4 (for females) or more drinks in a 2-hour period.

non-Hispanic respondents than White, non-Hispanic respondents ($P = 0.028$).

The levels of all outcomes for the full sample (SDC3, http://links.lww.com/JAM/A227) were slightly lower than the base case sample because most respondents excluded from the main analysis abstained in both months. The same statistically significant associations for sex and race/ethnicity were identified.

DISCUSSION

Respondents reported statistically significant increases in alcohol consumption after the enactment of stay-at-home orders and the relaxation of alcohol regulations in many states. The differences in consumption were consistent across demographic subgroups assessed, with statistically significantly larger differences in the proportion exceeding drinking limits for women compared with men and Black, non-Hispanic respondents compared with White, non-Hispanic respondents.

The disease burden associated with alcohol is already considerable.[8] Increased excessive alcohol consumption may add to this burden. Moreover, because excessive alcohol
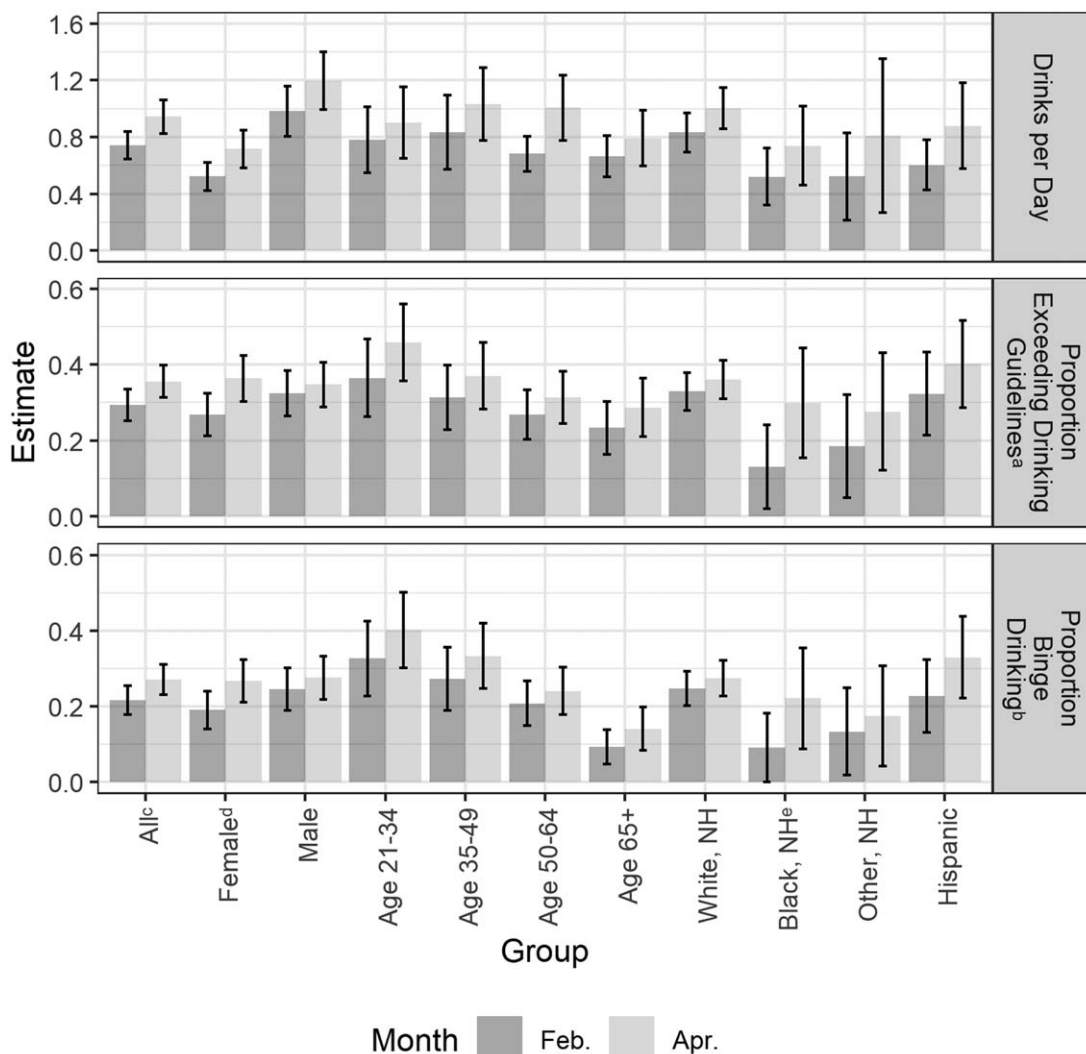
FIGURE 1. Drinking patterns overall and by group in February and April. Note: Conditional on drinking on at least 1 day in February. NH = non-Hispanic. Means and confidence intervals form predicted margins and are computed from survey-weighted linear regression (drinks per day) and logistic regression (binge drinking and exceeding drinking limits) on demographic characteristics, an indicator for April, and an interaction effect for April and all other covariates. Standard errors are clustered on the respondent. [a]More than 4 (for males) or 3 (for females) drinks in 1 day, or more than 14 (for males) or 7 (for females) drinks in 1 week. [b]Five (for males) or 4 (for females) or more drinks in a 2-hour period. [c]The overall level of the predicted margins was significantly higher in April than in February for drinks per day ($P < 0.001$), exceeding drinking limits ($P = 0.001$), and binge drinking ($P = 0.004$). [d]The difference in the proportion exceeding drinking limits in February and April was significantly higher for females than males ($P = 0.026$). [e]The difference in the proportion exceeding drinking limits in February and April was significantly higher for black, non-Hispanic respondents than White, non-Hispanic respondents ($P = 0.028$).

consumption may weaken the immune system, large increases in consumption may worsen the health of people with COVID-19.[9] The finding that more women than men reported drinking above recommended guidelines in April but not in February may warrant specific attention. In the last 2 decades, alcohol consumption and alcohol-related emergency department visits, hospitalizations, and deaths have increased markedly among women.[10] Also, the disproportionate impact of the pandemic on racial and ethnic minorities[11] might compound existing disparities in the consequences of excessive alcohol consumption.[12] The more economically

vulnerable, who are more affected by the pandemic,[11] also experience greater risk of alcohol-related problems.[4,5] People with alcohol use disorders may be particularly vulnerable because their support systems are limited by physical distancing measures. Increased alcohol consumption in the home, combined with the stress of confinement with others and economic instability, may lead to an increase in domestic violence.[13]

Several limitations must be noted. First, as with all surveys, there is potential for recall bias. Recall bias might be larger for February consumption, as respondents look back to

consumption 3 months ago. However, anchoring survey questions around a major event may help mitigate potential recall bias. Second, calendar-based methods, such as the Timeline Followback,[14] which require an in-depth respondent interview, might more accurately measure alcohol consumption. Study resources did not permit collecting nationally representative data using this gold standard approach. Third, a single cross-sectional survey cannot be used to adjust for seasonality in alcohol use. Self-reported alcohol consumption in the United States tends to be higher in November, December, January, and July.[15] Fourth, the results from this study represent associations between the onset of COVID-19 and alcohol consumption and do not represent causal relationships. Further work is needed to address the long-term effects of the pandemic on alcohol use and related harms.

CONCLUSIONS

The association between increased alcohol consumption and the COVID-19 pandemic suggests an urgent need to closely monitor alcohol consumption and related problems during and after the current pandemic.

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