

## OBSERVATION: BRIEF RESEARCH REPORT

## Retail Alcohol and Tobacco Sales During COVID-19

**Background:** Stress during the coronavirus disease 2019 (COVID-19) pandemic may increase substance use.

**Objective:** To assess national household retail sales of alcohol and tobacco.

**Methods and Findings:** Nielsen National Consumer Panel is a longitudinal household cohort that collects retail and e-commerce purchase data. The sample uses stratified random probability sampling (1) based on head of household. Noncontiguous states (Alaska and Hawaii) and persons in resident hotels, homes for the elderly, and prisons are excluded. Online recruitment is supplemented by door-to-door recruitment for minority populations that may have limited internet access. Accuracy aligns with government-commissioned national data sets with independent data validation.

Retail purchases of alcohol (wine; liquor; and beer, malt beverages, and cider) and tobacco (cigarettes, smokeless tobacco, e-cigarettes, and cigars) in U.S. dollars were captured by household, aggregated by demographic and geographic category. Nielsen provides national weighted measurements using sample weights to reflect U.S. Census data in 9 demographic and 61 geographic targets in the United States (2). Weights incorporate the complex survey design and undersampling when present and are updated annually to reflect changes in the population.

We selected 1 April to 30 June 2020 as the study period because starting on 1 April provided a washout period for differing state lockdown timing and initial hoarding behavior in March 2020 (3) and because 3-month periods provided sufficient sample size for each demographic cell.

To assess prepandemic secular trends, we collected April-to-June sales data for prepandemic years (2017 to 2019) compared with such data during the pandemic (2020).

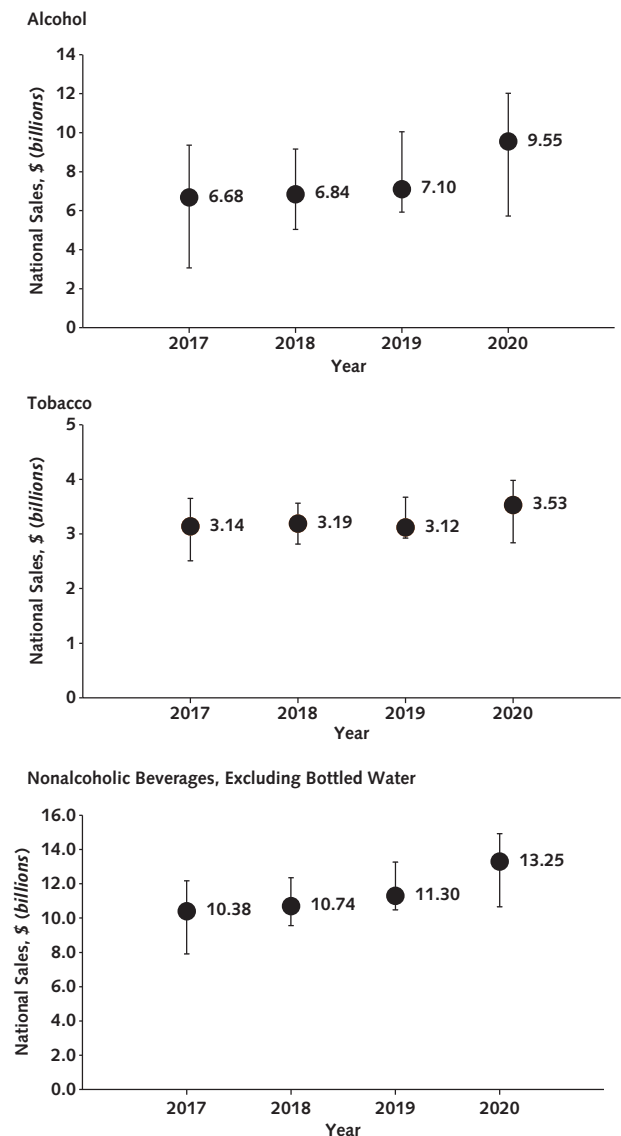
To estimate consumer behavior shifts from on-premise (such as restaurants and bars) to off-premise (that is, home) consumption, as well as other pandemic-related purchasing behavior not specific to substance misuse (for example, hoarding, consumer confidence changes, and income or employment changes), we repeated all analyses using purchases of nonalcoholic beverages excluding bottled water and total purchases of any item by a non-alcohol purchaser, which would be expected to increase with on-premise closures. To account for purchasing at different prices (such as discounted items) and tax or tariff changes, we also assessed units (1 unit = 1 barcode scan) instead of dollars. Finally, to account for possible mixed demographics within households, we repeated analyses restricted to single-member households.

The unweighted April-to-June 2020 cohort included 71 502 households: 31 296 (44%) recorded at least 1 unit of alcohol, and 11 265 (16%) recorded at least 1 unit of tobacco.

Total weighted sales from April to June increased from \$7.10 billion in 2019 to \$9.55 billion in 2020 (relative change, +34.4%) for alcohol (Figure, top) and from \$3.12 billion in 2019 to \$3.53 billion in 2020 (relative change, +13.2%) for tobacco (Figure, middle).

National weighted alcohol and tobacco sales increased in all demographic and geographic categories comparing 2019

Figure. Weighted national estimates of retail sales.



Point estimates (circles) with 95% CIs (error bars). Top. Alcohol. Middle. Tobacco. Bottom. Nonalcoholic beverages, excluding bottled water.

versus 2020 (April to June), except among households with an annual income less than \$20 000 for alcohol sales (relative change,  $-0.8\%$ ) (Table). Relative increases in alcohol sales were higher among higher-income households, younger adults, larger households, households with children younger than 18 years, and ethnic minorities; relative increases in tobacco sales were higher among these demographics as well (data not shown). Relative increases in sales were higher for liquor (+49.2%) than for wine (+29.1%) or beer, malt beverages, and cider (+30.2%) (data not shown).

In analyses to assess confounding, purchases of nonalcoholic beverages excluding bottled water increased from \$11.3 billion to \$13.3 billion (relative change, +17.7%) (Figure,

**Table.** Observed National Estimates of Alcohol Sales During 1 April to 30 June in 2019 and 2020\*

Characteristic	All Households, n (%)†		Alcohol				Relative Change in Sales, %
	2019	2020	2019		2020		
			Households, n‡	Sales (95% CI), \$ (billions)§	Households, n‡	Sales (95% CI), \$ (billions)§	
<b>Total</b>	73 202 (100)	71 502 (100)	28 378	7.10 (5.9-10.0)	31 296	9.55 (5.7-12.0)	+ 34.4
<b>Household demographics</b>							
Annual household income							
<\$20 000	6591 (13.5)	7043 (13.2)	1750	0.60 (0.6-0.6)	2094	0.59 (0.5-0.6)	-0.8
\$20 000-\$29 999	6939 (10.5)	6816 (9.6)	2050	0.47 (0.4-0.6)	2369	0.57 (0.3-0.7)	+ 21.9
\$30 000-\$39 999	7812 (8.9)	7437 (8.5)	2679	0.51 (0.4-0.6)	2879	0.58 (0.4-0.7)	+ 15.3
\$40 000-\$49 999	7939 (8.3)	7564 (8.1)	2919	0.48 (0.4-0.7)	3066	0.61 (0.4-0.8)	+ 27.1
\$50 000-\$69 999	13 059 (13.7)	12 356 (13.5)	5137	0.91 (0.8-1.2)	5397	1.16 (0.8-1.4)	+ 27.6
\$70 000-\$99 999	15 711 (15.5)	15 113 (15.6)	6717	1.21 (1.0-1.8)	7337	1.65 (1.0-2.1)	+ 36.3
≥\$100 000	15 151 (29.6)	15 174 (31.5)	7126	2.93 (2.3-4.5)	8155	4.38 (2.3-5.7)	+ 49.4
Members in household							
1	17 116 (27.2)	17 553 (27.3)	5542	1.54 (1.3-2.2)	6374	2.02 (1.2-2.5)	+ 31.0
2	28 718 (32.4)	28 780 (32.4)	12 704	3.11 (2.7-4.2)	13 936	4.00 (2.6-4.9)	+ 28.9
3-4	20 698 (29.3)	18 973 (29.3)	7900	1.86 (1.5-2.8)	8526	2.68 (1.4-3.5)	+ 43.9
≥5	6671 (11.0)	6195 (11.1)	2232	0.59 (0.5-0.9)	2460	0.84 (0.5-1.1)	+ 42.5
Children aged <18 y							
Yes	19 488 (31.0)	17 350 (30.7)	6893	1.70 (1.3-2.7)	7399	2.50 (1.3-3.3)	+ 47.0
No	53 714 (69.0)	54 152 (69.3)	21 485	5.41 (4.6-7.4)	23 898	7.05 (4.5-8.7)	+ 30.3
<b>Head of household demographics  </b>							
Age							
<35 y	7553 (14.6)	6294 (14.3)	2670	0.72 (0.6-1.1)	2621	1.03 (0.5-1.4)	+ 43.1
35-44 y	12 856 (15.3)	12 073 (15.3)	4660	0.90 (0.7-1.4)	5236	1.32 (0.8-1.7)	+ 46.6
45-54 y	13 970 (16.3)	13 779 (16.3)	5559	1.19 (0.9-1.8)	6351	1.66 (0.8-2.2)	+ 40.0
55-64 y	16 747 (17.0)	16 790 (17.2)	6963	1.45 (1.3-1.9)	7742	1.87 (1.3-2.2)	+ 29.2
>64 y	15 453 (16.0)	15 876 (16.0)	6008	1.04 (0.7-1.5)	6611	1.39 (0.8-1.8)	+ 33.7
Employed							
Full time	39 386 (46.8)	38 395 (47.5)	15 565	3.22 (2.6-4.9)	17 675	4.66 (2.5-6.0)	+ 44.9
Part time	26 526 (32.4)	25 749 (32.8)	10 708	2.27 (1.8-3.5)	12 166	3.32 (1.7-4.3)	+ 46.1
No	12 860 (14.4)	12 646 (14.7)	4857	0.95 (0.8-1.4)	5509	1.35 (0.8-1.7)	+ 41.9
	27 190 (32.3)	26 417 (31.6)	10 294	2.08 (1.8-2.7)	10 886	2.62 (1.8-3.2)	+ 25.8
Highest education							
High school graduate	14 502 (25.3)	14 270 (24.4)	5217	1.73 (1.6-2.1)	5866	2.12 (1.6-2.4)	+ 22.0
Some college	20 002 (24.6)	19 620 (24.4)	7730	1.62 (1.3-2.3)	8645	2.24 (1.2-2.9)	+ 38.0
College graduate	30 848 (26.6)	29 590 (27.3)	12 526	1.77 (1.3-3.0)	13 609	2.74 (1.2-3.7)	+ 55.2
Race							
White¶	55 921 (74.6)	55 921 (74.3)	22 915	5.66 (4.7-8.0)	24 751	7.57 (4.5-9.5)	+ 33.7
African American	8208 (12.6)	8421 (12.6)	2895	0.64 (0.5-1.0)	3624	0.92 (0.5-1.2)	+ 42.3
Asian	3057 (4.5)	3039 (4.8)	994	0.23 (0.2-0.4)	1113	0.35 (0.2-0.5)	+ 54.6
Hispanic	4782 (13.3)	5964 (13.8)	2394	0.96 (0.8-1.4)	2850	1.34 (0.8-1.7)	+ 39.7
Other	4154 (8.3)	4122 (8.3)	1575	0.57 (0.5-0.7)	1808	0.71 (0.5-0.8)	+ 24.5
<b>Geography demographics</b>							
County size**							
A	27 517 (40.9)	27 005 (40.8)	10 961	3.08 (2.6-4.4)	12 176	4.19 (2.5-5.3)	+ 35.9
B	23 794 (30.7)	23 071 (30.9)	9552	2.27 (1.9-3.2)	10 360	3.07 (1.8-3.9)	+ 35.5
C	11 793 (14.9)	11 505 (14.9)	4430	0.98 (0.8-1.3)	4888	1.30 (0.8-1.6)	+ 32.0
D	10 098 (13.5)	9922 (13.4)	3435	0.77 (0.7-1.0)	3872	0.99 (0.6-1.2)	+ 28.1

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Characteristic	All Households, n (%)†		Alcohol				Relative Change in Sales, %
	2019	2020	2019		2020		
			Households, n‡	Sales (95% CI), \$ (billions)§	Households, n‡	Sales (95% CI), \$ (billions)§	
Geographic region							
East	12 481 (17.6)	12 051 (17.5)	3833	0.78 (0.6–1.2)	4197	1.14 (0.6–1.5)	+ 45.0
Central	18 398 (21.7)	18 005 (21.7)	7538	1.52 (1.2–2.2)	8436	2.08 (1.2–2.6)	+ 37.2
South	28 314 (38.7)	27 775 (38.9)	11 090	2.74 (2.4–3.6)	12 307	3.55 (2.4–4.3)	+ 29.7
West	14 010 (21.9)	13 670 (22.0)	5918	2.07 (1.7–3.0)	6356	2.78 (1.6–3.6)	+ 34.5

\* Households are provided a handheld scanner and/or smartphone app and instructed to record all purchases for consumption by the household. Households are trained in a way intended to optimize completeness of recording but not to change behavior; they are instructed that a purchase by any household member should be recorded but not to scan an item if it was purchased for business, resale, or civic organizational use. Households are offered incentives geared toward long-term participation: They earn points that can be redeemed for merchandise and can also be included in monthly prize drawings and sweepstakes; these rewards are specifically intended to be unbiased and to not affect purchase behavior (i.e., the philosophy is to reward data transmission regularity and long-term participation, not dollar amount spent). Accurate recording of dollars spent on the products by the specific household is confirmed by universal product code, and households are randomly contacted to validate their recorded purchasing behavior. Households are dropped for noncompliance, for outlier reporting, and on a voluntary basis. Households can also join the panel at any time. The average tenure of a Nielsen household is 5 y; attrition and new households are taken into account in national weighted measurements based on sample weights of their demographic and geographic target. Cut points subdividing demographic and geographic categories were predetermined by Nielsen and align closely with U.S. Census subcategories.

† Unweighted number (n) of households in total cohort and weighted proportion (%) of national U.S. household composition using sample weights.

‡ Unweighted number of households purchasing  $\geq 1$  unit of alcohol during 1 April–30 June of the given year.

§ Weighted national estimate of sales, in billions of U.S. dollars.

|| Demographics are based on female head of household because household purchasing behavior is most associated with the demographics of the female rather than male head of household. There was no female head of household among 6626 households (weighted percentage, 20.9%) and 6690 households (weighted percentage, 20.9%) in the unweighted cohort during the study periods in 2019 and 2020, respectively—these households were excluded for this section of the table.

¶ Includes non-Hispanic and Hispanic White. Race classifications were provided by Nielsen and are based on participant self-report. Race was assessed to evaluate potential race-specific changes in alcohol and tobacco retail sales.

\*\* County size A includes all counties in the largest metropolitan areas, accounting for 40% of U.S. households. County size B refers to all counties in the next largest set of metropolitan areas, which cumulatively account for 30% of U.S. households. No nonmetropolitan counties are large enough to qualify as A or B counties. County size C includes the next largest set of areas, including both metropolitan and nonmetropolitan areas and accounting for 15% of U.S. households. County size D includes all other counties.

bottom) and total purchases of any item by a non-alcohol purchaser increased from \$88.4 billion to \$90.7 billion (relative change, +2.6%) (data not shown) in 2019 to 2020 (April to June). Results using units instead of dollars were consistent with the primary analyses, suggesting that results are independent of any pricing differences or changes in taxes or tariffs during the study period. Results from the data set of single-member households were consistent with primary analyses, suggesting that results are independent of mixed-household demographics.

**Discussion:** Retail alcohol and tobacco sales increased 34% and 13%, respectively, early during the COVID-19 pandemic compared with the same period in the year prior. The greater increase in alcohol sales unlikely reflects bar and restaurant closures alone because alcohol sales increased more (+34.4%) than nonalcoholic beverage sales (+17.7%) or total sales by a non-alcohol purchaser (+2.6%). Previous estimates (4) were that 22% growth of off-premise alcohol sales would be needed to fully offset on-premise losses from closures—in our analysis, alcohol sales increased 34%.

Alcohol and tobacco purchases increased in all geographic and almost all demographic categories. Relative increases were higher in the same demographic subgroups reported to have increased stress and anxiety during the pandemic (5). However, aggregated data limit conclusions regarding individual consumption patterns and whether increases are due to increased drinking versus purchases for other uses (such as baking and cooking).

Further research should explore whether increased alcohol and tobacco sales may be associated with increased health

threats from substance use, which would require the attention of health professionals and policymakers.

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**Disclaimer:** This was an investigator-led study with no external funding. Analyses and calculations by authors listed in this study are based in part on data reported by Nielsen through its National Consumer Panel for 1 April to 30 June in the years 2017 to 2020, for Total US and All Outlets (copyright 2020, Nielsen Consumer). The conclusions drawn from the Nielsen data are those of this study's authors and do not reflect the views of Nielsen.

**Disclosures:** Disclosures can be viewed at [www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M20-7271](http://www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M20-7271).

**Reproducible Research Statement:** Study protocol: Available from Dr. Terrault (e-mail, [terrault@usc.edu](mailto:terrault@usc.edu)). Statistical code and data set: Not available.

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## References

1. Harris JM. Using Nielsen Homescan data and complex survey design techniques to analyze convenience food expenditures. Presented at American Agricultural Economics Association Annual Meeting, Providence, Rhode Island, 24-27 July 2005.
2. Einav L, Leibtag E, Nevo A. On the accuracy of Nielsen Homescan data. U.S. Department of Agriculture Economic Research Service; 2008. Economic Research Report no. 69.
3. Suthivarakom G. Don't overdo the coronavirus stockpiling. *New York Times*. 31 March 2020. Accessed at [www.nytimes.com/2020/03/31/smarter-living/wirecutter/dont-overdo-the-coronavirus-stockpiling.html](http://www.nytimes.com/2020/03/31/smarter-living/wirecutter/dont-overdo-the-coronavirus-stockpiling.html) on 20 August 2020.
4. Nielsen. Rebalancing the 'COVID-19 effect' on alcohol sales. 7 May 2020. Accessed at <https://nielseniq.com/global/en/insights/2020/rebalancing-the-covid-19-effect-on-alcohol-sales> on 20 August 2020.
5. Czeisler MÉ, Lane RI, Petrosky E, et al. Mental health, substance use, and suicidal ideation during the COVID-19 pandemic – United States, June 24-30, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69:1049-1057. [PMID: 32790653] doi:10.15585/mmwr.mm6932a1