

OBSERVATION: BRIEF RESEARCH REPORT

Alcohol Sales and Alcohol-Related Emergencies During the COVID-19 Pandemic

Background: During the coronavirus disease 2019 (COVID-19) pandemic, many regions across the world recommended stay-at-home orders, closure of public spaces, and physical distancing to reduce community transmission (1). These measures contributed to isolation and anxiety, with recent surveys indicating increased subsequent consumption of alcohol (2). Although drinking can lead to temporary relief of stress, alcohol misuse is a leading cause of mortality worldwide, contributing to about 3 million deaths annually (1).

Objective: To examine changes in alcohol sales and alcohol-related emergencies after the onset of the first wave of the COVID-19 pandemic.

Methods and Findings: We examined alcohol sales and alcohol-related emergencies in Ontario, Canada (population, 14.7 million), from 1 July 2018 to 30 June 2020. A lockdown was declared on 17 March and ended on 24 July 2020, with the province ordering the closure of bars, restaurants, and other nonessential businesses soon thereafter. In contrast, alcohol stores were deemed essential and remained open.

We obtained alcohol sales data in Canadian dollars (weekly, then aggregated to monthly) from the Liquor Control Board of Ontario, the government agency overseeing retail sales in the province for more than 99% of spirits, 83% of wine, and 31% of beer. We obtained data on monthly alcohol-related emergency visits from the Ontario Ministry of Health. Alcohol-

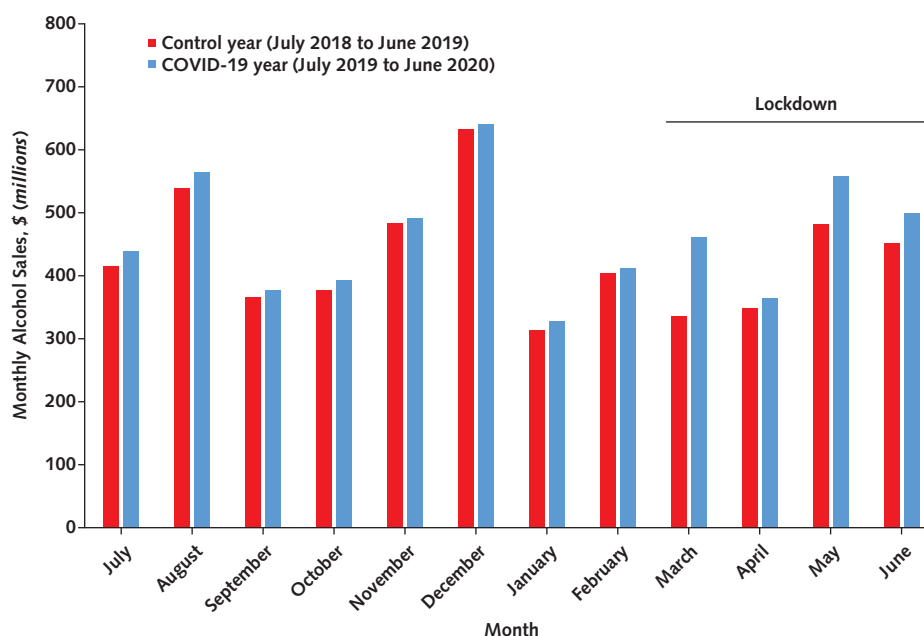
related emergencies were grouped into 4 diagnostic subcategories: psychiatric, gastrointestinal, intoxication, and miscellaneous.

We compared alcohol sales and alcohol-related emergencies during the first months of the COVID-19 pandemic (March to June 2020) with those in the corresponding months in the prior year (March to June 2019). This study was approved by the University of Toronto's research ethics board.

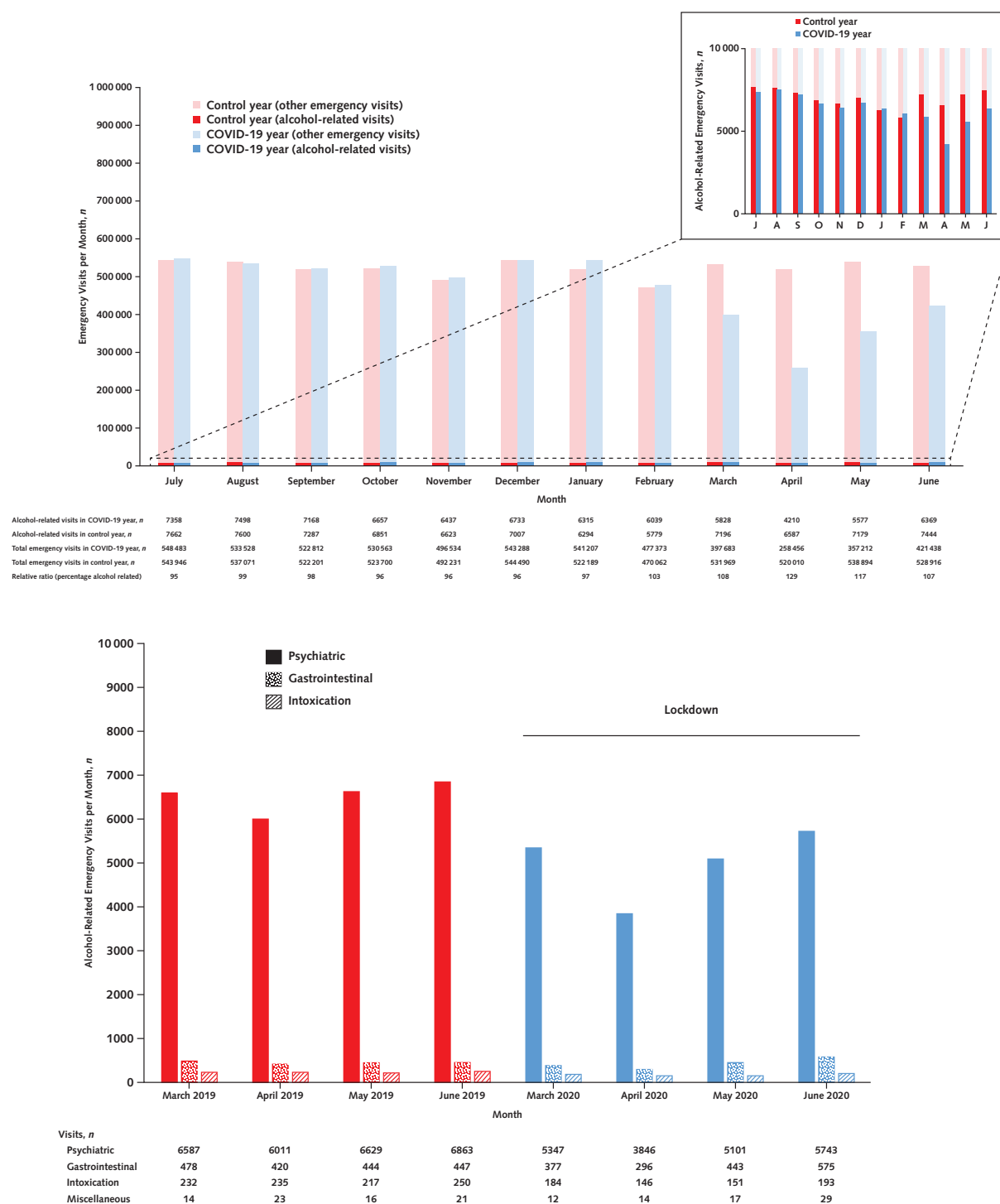
Alcohol sales totaled \$5.537 billion from 1 July 2019 to 30 June 2020, of which \$1.885 billion was from March to June 2020. In contrast, sales totaled \$5.156 billion from 1 July 2018 to 30 June 2019, of which \$1.617 billion was from March to June 2019. Year-to-year monthly increases in alcohol sales were highest at the onset of the pandemic, with \$462 million in sales in March 2020 versus \$335 million in March 2019—equal to a 38% relative increase (Figure 1).

We observed 76 189 alcohol-related and 5 628 577 total emergency visits from 1 July 2019 to 30 June 2020, and 83 509 alcohol-related and 6 275 679 total emergency visits from 1 July 2018 to 30 June 2019. The average monthly number of alcohol-related emergency visits from March to June 2020 was 5496 (95% CI, 5423 to 5569), versus 7102 (CI, 7019 to 7184) from March to June 2019, reflecting a 23% (CI, 21% to 24%) relative decrease during the lockdown (Figure 2, top). Accounting for the 32% decline in overall emergency visits from March to June 2020 compared with March to June 2019, the rate of alcohol-related emergency visits was 15.2 per 1000 visits (CI, 14.7 to 15.7) in March to June 2020 compared with 13.4 per 1000 visits (CI, 12.9 to 13.9) in March to June 2019, equal to a 13% relative increase. Most alcohol-related visits in both years were categorized as psychiatric complications from alcohol use (Figure 2, bottom).

Figure 1. Alcohol sales and emergencies from July 2018 to June 2020.



Total sales for each month. Bars compare monthly sales of alcohol in the pandemic year (July 2019 to June 2020) with corresponding months in the control year (July 2018 to June 2019). COVID-19 = coronavirus disease 2019.

Figure 2. Alcohol-related emergencies from July 2018 to June 2020.

COVID-19 = coronavirus disease 2019. **Top.** Absolute numbers of monthly alcohol-related emergencies and non-alcohol-related emergencies. Bars compare emergency visits in the pandemic year (July 2019 to June 2020) with corresponding months in the control year (July 2018 to June 2019). **Bottom.** Types of alcohol-related emergencies per month during March to June 2020 versus March to June 2019. Blue is COVID-19 year and red is control year. Totals may not sum exactly because some emergencies were classified into >1 diagnostic category. International Classification of Diseases, 10th Revision, codes for alcohol-related emergencies: F100-F109 (psychiatric); K700-K704, K292 K709, K852, and K860 (gastrointestinal); R780, T510, T519, X45, X65, and Y15 (intoxication); and E244, G312, G621, G721, I426, P043, Q860, Q99304, and Q99305 (miscellaneous).

Discussion: Substantial increases in alcohol sales during the COVID-19 lockdown were not mirrored by immediate absolute increases in alcohol-related emergencies, but visits for these outcomes decreased to a lesser extent than overall emergency department visits.

Social isolation, financial strain, and anxiety may explain the observed pattern of increased alcohol sales during the lockdown (1). This is especially concerning given that decreases in hospital and community resources reduced access to mental health and addiction support services.

Higher alcohol sales during the lockdown are worrisome because alcohol consumption can cause poor judgment, medical complications, and immune suppression. Alcohol also disrupts airway ciliary function, decreases recruitment of neutrophils into the alveoli, and weakens the pulmonary epithelial barrier (3). Consuming even moderate amounts of alcohol increases the risk for respiratory failure, which could worsen COVID-19 illness (3).

The absolute decline in total alcohol-related emergency visits may reflect a general reluctance to seek care or changes in drinking patterns (4). Despite increased alcohol consumption, some studies report shifts away from the harmful drinking that typically arises in social settings outside the home. In addition, the harmful effects of alcohol are often delayed; thus, increases in alcohol-related health care visits may be anticipated in the future.

A limitation of our study is that absolute numbers of all emergency visits may be substantially distorted because of an overall reluctance to visit hospitals during the lockdown (4). In addition, the true extent of long-term harm is difficult to establish, and further studies are needed to examine the delayed effects of increased alcohol consumption during the pandemic.

Our findings suggest that increases in alcohol purchases early in the pandemic were not associated with immediate absolute increases in alcohol-related emergencies, although visit rates for these outcomes increased, a phenomenon similarly observed for mental health, overdose, and violence outcomes during the COVID-19 pandemic (5). As such, clinicians should caution patients about the risks of alcohol consumption during the pandemic. In addition, public health measures to reduce the spread of COVID-19 should be matched by strategies to meet the treatment needs of patients with alcohol use disorders.

Jonathan S. Zipursky, MD

Nathan M. Stall, MD

University of Toronto and Institute for Health Policy,
Management, and Evaluation, Toronto, Ontario, Canada

William K. Silverstein, MD

University of Toronto, Toronto, Ontario, Canada

Qing Huang, MSc, PMP

Justin Chau, BEng, BME

Ontario Ministry of Health, Toronto, Ontario, Canada

Michael P. Hillmer, MSc, PhD

Institute for Health Policy, Management, and Evaluation,
University of Toronto, and Ontario Ministry of Health, Toronto,
Ontario, Canada

Donald A. Redelmeier, MD, MSHSR

Institute for Health Policy, Management, and Evaluation,
University of Toronto, and Evaluative Clinical Sciences
Platform, Sunnybrook Research Institute, Toronto, Ontario,
Canada

Acknowledgment: The authors thank Alex Kiss for statistical support and Maria Cusimano for comments on earlier versions of the manuscript; they were not compensated for their time.

Financial Support: Drs. Zipursky and Stall are supported by the Department of Medicine's Eliot Philipson Clinician Scientist Training Program and Clinician Investigator Program at the University of Toronto. Dr. Zipursky has also received a CIHR Banting and Best Doctoral Award. Dr. Redelmeier is supported by a Canada Research Chair in Medical Decision Science.

Disclosures: Disclosures can be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M20-7466.

Reproducible Research Statement: Study protocol and statistical code: Available from the authors on request (e-mail, kamil.malikov@utoronto.ca), with the understanding that the computer programs may rely on coding templates or macros that are unique to the Ontario Ministry of Health and, therefore, are either inaccessible or may require modification. Data set: Not publicly available.

Corresponding Author: Jonathan S. Zipursky, MD, Sunnybrook Health Sciences Centre, E240, 2075 Bayview Avenue, Toronto, ON M4N 3M5, Canada; e-mail, jonathan.zipursky@sunnybrook.ca.

doi:10.7326/M20-7466

References

1. Clay JM, Parker MO. Alcohol use and misuse during the COVID-19 pandemic: a potential public health crisis? [Letter]. *Lancet Public Health*. 2020;5:e259. [PMID: 32277874] doi:10.1016/S2468-2667(20)30088-8
2. Pollard MS, JS, Green HD Jr. Changes in adult alcohol use and consequences during the COVID-19 pandemic in the US. *JAMA Netw Open*. 2020;3:e2022942. [PMID: 32990735] doi:10.1001/jamanetworkopen.2020.22942
3. Simou E, Leonardi-Bee J, Britton J. The effect of alcohol consumption on the risk of ARDS: a systematic review and meta-analysis. *Chest*. 2018;154:58-68. [PMID: 29288645] doi:10.1016/j.chest.2017.11.041
4. Rosenbaum L. The untold toll—the pandemic's effects on patients without Covid-19. *N Engl J Med*. 2020;382:2368-2371. [PMID: 32302076] doi:10.1056/NEJMs2009984
5. Holland KM, Jones C, Vivolo-Kantor AM, et al. Trends in US emergency department visits for mental health, overdose, and violence outcomes before and during the COVID-19 pandemic. *JAMA Psychiatry*. 2021. [PMID: 33533876] doi:10.1001/jamapsychiatry.2020.4402