SPECIAL EDITION

Alcohol and the coronavirus pandemic:

individual, societal and policy perspectives



ALCOHOL AND SOCIETY 2021

A REVIEW OF INTERNATIONAL AND SWEDISH RESEARCH

Organisations initiating this report are voluntary or academic organisations independent of commercial interests.

SFAM is the professional and scientific college of general practitioners (family physicians) in Sweden with continuing professional development, training of future GPs, assessment of competence, quality improvement and research in general practice/family medicine as main areas of interest. **The Swedish Society of Nursing** is a nonprofit organization and a forum for discussing and developing nursing care by promoting nursing research, ethics, education and quality in nursing. **IOGT-NTO** focuses on the effects of alcohol and narcotics on individuals and society, but is also engaged in broad social and club activities. The foundation **Stiftelsen Ansvar För Framtiden** aim to further Nordic cooperation and scientific research regarding sober life styles, public opinion in this regard, as well as care of children. The foundation have eight member organisations in three Nordic countries. **CERA** is an interdisciplinary and collaborative centre for education and research into hazardous use, abuse and addiction at Gothenburg University – which works to strengthen and develop research and education in the field of addiction, and to disseminate scientific expertise to people working professionally in the field of abuse and addiction, and other interested parties. The **Swedish Society of Addiction Medicine** works to promote research and education in the addiction medicine field, and professional development in all specialist care professions. **SIGHT** is Sweden's research arena for global health equity with a focus on children and youth: a multidisciplinary tool-box to fulfill the 2030 Agenda.

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Foreword

2020 was the year when the world came together to address a shared global challenge. COVID-19 compelled governments, authorities, and researchers from all over the world to work together to save human lives.

Different countries' corona strategies have handled alcohol consumption in very different ways. Some countries were quick to reduce the availability of alcoholic drinks, while others have viewed alcohol as a possible lifesaver for the local economy. The role of alcohol consumption, and its consequences, have not been addressed as part of Sweden's corona strategy.

The researchers behind the series of reports entitled "Alcohol and Society" consequently decided that they would like to take a closer look at the role of alcohol consumption in spreading the corona virus and contracting COVID-19. The theme of the 2021 report is, therefore, the effect of alcohol on the immune system and on transmission of the virus, given the effect of alcohol on human behaviour. The report also examines the ways in which the effects of the pandemic – in terms of anxiety, social isolation, unemployment, etc., – have affected alcohol consumption and the ways in which the alcohol industry and the world's governments have responded to these challenges.

As in previous years, the report has been written by a group of some of the world's leading alcohol researchers, led by Harold Holder.

As the pandemic is still ongoing and the situation is changing rapidly, the research group has been obliged to adjust its choice of method and sources accordingly. The report is therefore different in focus from previous ones. Rather than focusing on critiquing scientific evidence to improve our understanding of a relatively established topic, the researchers took a broad scan of different information sources in order to highlight and contextualize areas where concerns may only just now be emerging.

The aim of the "Alcohol and Society" series of reports is to highlight what scientific studies can tell us about the effects of alcohol consumption at both an individual and a societal level. This is the eighth such report. Previous years' reports have focused on such issues such as alcohol and young adults, second-hand effects of alcohol consumption, alcohol and violence, and alcohol and pregnancy. These reports, along with this year's edition, are available on our respective websites. The following organisations support this year's report:

- The Center for Education and Research on Risk, Abuse and Addiction (CERA), University of Gothenburg
- The Swedish Society of Nursing
- Stiftelsen Ansvar för Framtiden (SAFF)
- The Swedish Association of General Practice
- The Swedish Society of Addiction Medicine
- Swedish Institute for Global Health Transformation (SIGHT) at The Royal Swedish Academy of Sciences
- IOGT-NTO
- Movendi International

It is our hope that this report will help increase knowledge and awareness of alcohol-related risks in connection with both this and future pandemics, both in purely physical terms – in that alcohol weakens the immune system – as well as increased risk of the spread of infection, due to alcohol's effect on human behaviour.

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Executive summary

- Alcohol use may increase the risk of COVID-19 infection and of its severe complications while also causing other medical and social problems that burden healthcare and other services.
- Alcohol increases COVID-19 transmission by reducing social inhibitions even at low consumption levels, and causing severe impairment at higher levels, thus disrupting preventative strategies, such as social distancing and hand hygiene.
- Many complications from heavy alcohol use are themselves risk factors for more serious outcomes from COVID-19 infection (e.g. diabetes, obesity, cardiovascular disease).
- Alcohol use, especially heavy use, can compromise immune system responses and also increase susceptibility to serious respiratory illnesses.
- Alcohol-related problems consume substantial health care resources; during COVID-19 strong alcohol control policies could relieve these overstretched services by reducing both alcohol- and COVID-related healthcare demand.
- In high income countries, surveys tend to show that more people increased than reduced drinking during the early COVID-19 lockdowns, while total sales and consumption have mostly decreased in low income countries. Local factors and government policies on alcohol availability are key. In Sweden, consumption was reduced by 7% during March and April2020 because increased retail sales were more than offset by reduced travelers' imports.
- Domestic violence has increased in many places during the pandemic, a problem in which alcohol use is often implicated.
- Traffic crashes decreased in most countries due to reduced travel.
- COVID-19-related isolation, boredom, stress and depression during the pandemic can be worsened by alcohol consumption; these same factors may also lead to excessive alcohol consumption.
- Many governments have exempted off-trade alcohol outlets and alcohol manufacturers from lockdown conditions, designating these as essential services, decisions that, in many countries, have been influenced by alcohol industry lobbying.
- Major regulatory changes or concessions (e.g., liberalizing home delivery of alcohol) will be difficult to reverse and are therefore likely to persist after the pandemic.

- The following public health policies are recommended for pandemics:
  - suspend alcohol service at sports arenas and large events;
  - prohibit alcohol consumption in public places such as parks and beaches;
  - restrict drinking at high-risk on-trade settings such as bars and nightclubs;
  - impose limits on home delivery, if permitted at all;
  - make clinical and treatment provisions for people experiencing all types of alcohol-related problems, including dependence;
  - increase access to mental health services, including online services.
- Health authorities should advise individuals at high-risk for infection or serious complications to reduce or avoid alcohol use (e.g., elderly, overweight, diabetic, smokers, people with respiratory disease, cancer, or cardiovascular disease).
- Given the strong inter-relationship between alcohol and COVID-19, alcohol policies should be maintained or strengthened during the pandemic, not relaxed.
- Effective policies, including those to reduce physical availability of alcohol and increase its price through increased alcohol taxes and minimum prices, could help limit viral spread, reduce burden on health services and raise much needed extra government revenue.



Alcohol increases COVID-19 transmission by reducing social inhibitions even at low consumption levels, and causing severe impairment at higher levels.

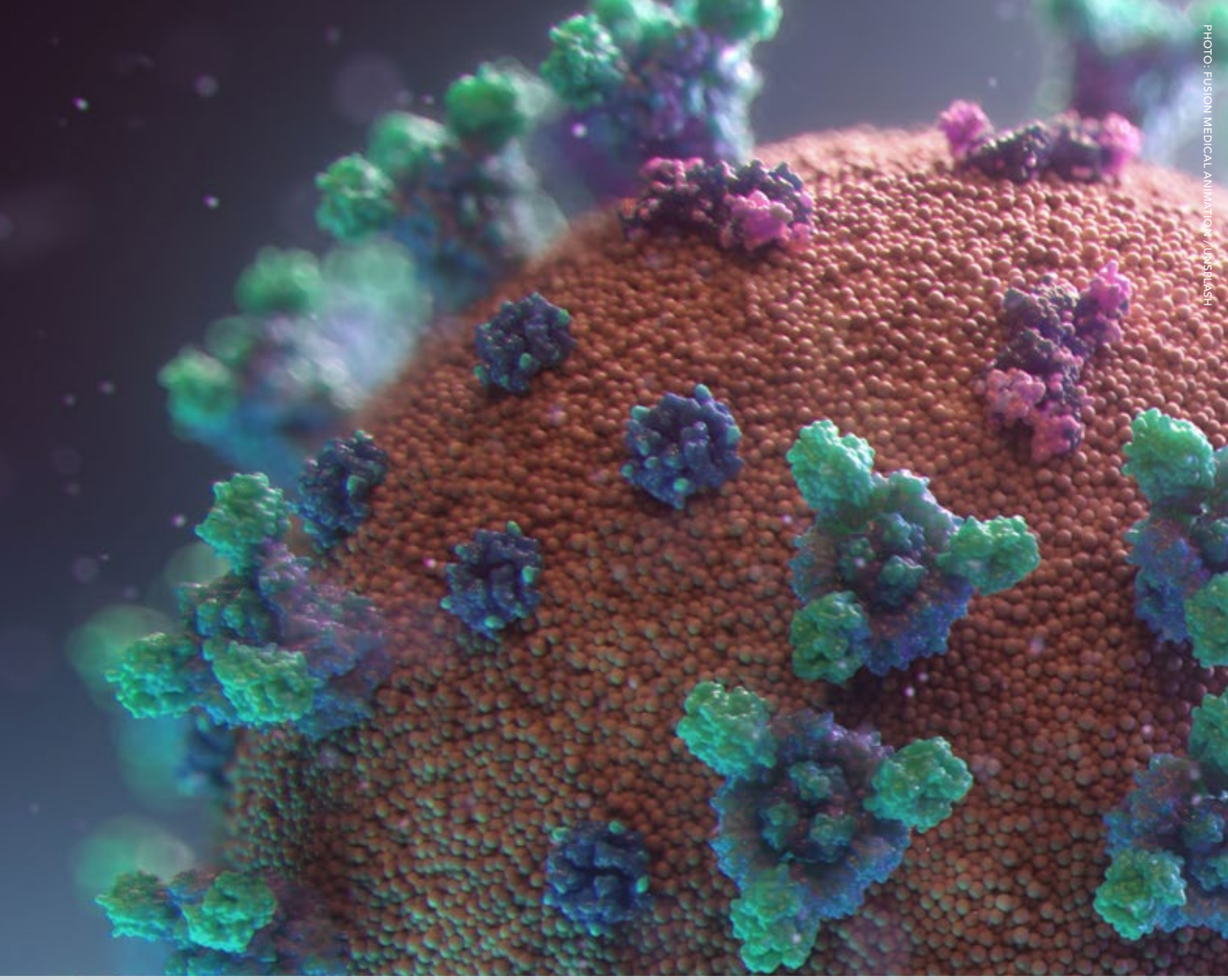

PHOTO: FUSION MEDICAL ANIMATION / UNSPLASH

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Introduction

The COVID-19 pandemic has had enormous impacts on societies worldwide, and its impact on alcohol consumption, related harms and alcohol control policies has also been significant. In turn, alcohol has played a central role in the transmission of COVID-19 between individuals and across populations, and has negatively influenced medical, social and economic effects of the pandemic.

For this report, our aim was to synthesize the emerging and rapidly expanding evidence for multiple, complex relationships between alcohol and COVID-19 that operate across many aspects of life. Due in large part to the uniqueness and uncertainties of the present state of play, this report has some differences to previous reports in this series. Rather than focusing on critiquing scientific evidence (e.g. study methods, design limitations) to improve our understanding of a relatively established topic, we took a broad scan of different information sources in order to highlight and contextualize areas where concerns may only just now be emerging that are specific to alcohol use and COVID-19. We have also drawn upon decades of research evidence regarding the role of alcohol policies in influencing the consumption of alcohol in a population and, in turn, the impacts of this consumption on health and social outcomes.

The report begins by discussing the effects of alcohol consumption on COVID-19 in terms of an individual's susceptibility to infection and transmission of the virus through physiological and cognitive-behavioral pathways. We provide evidence, in particular, for how alcohol's various effects on behavior have influenced the course of the pandemic.

We then examine the converse, that is, the pandemic's effect on population-level alcohol consumption and related social harms. These effects are mediated through a variety of forces related to the large-scale disruption wrought on social and economic life as well as policy responses that specifically affect alcohol availability (e.g. alcohol bans, lifting of off-trade restrictions). We then reflect on how governments have responded to challenges imposed by the pandemic and how the actions of alcohol industry vested interests have played a major role in shaping policy decisions, that if left unchecked, will increase alcohol's burden on public health and safety in the longer-term.

We conclude by summarizing what has been learned about alcohol consumption, related outcomes and activities during the pandemic, and provide recommendations for individuals and governments, with a particular focus on alcohol policies. Alcohol policies have a crucial role to play both in reducing alcohol-related harms and controlling transmission of the virus.



PHOTO: ANNIE SPRATT / UNSPLASH

1 Implications of physiological and cognitive effects of alcohol for transmission of COVID-19

Alcohol use, particularly heavy use, may increase an individual's risk of contracting and transmitting infectious disease as well as increase symptom severity. Elevated risks of infection and disease progression have been established for alcohol for other communicable diseases such as tuberculosis, pneumonia and HIV.[1] There are many reasons to suspect that this will also prove to be the case for COVID-19. Pathways by which this may occur include direct effects on immune system and organ-specific functioning (e.g. lungs, liver, gut), psychiatric conditions, as well as through alcohol's psychoactive effects on cognitive functions and behaviors (e.g. inhibition, risk taking) that may also interact with drinking context to influence risk.

1.1 Immune system

Immunity to infection in humans occurs through both innate and acquired mechanisms. Most humans are born with some innate immunity to infection, such that our bodies are able to detect common infectious agents. Our innate immune system activates a first line of defence in the form of macrophage, dendritic and natural killer (NK) cells to deal with common threats. But the innate immune system is a generalist and not always successful at fully combatting new invading pathogens. This is where the acquired (or adaptive) immune system comes in, after being activated by chemical cues that signal the presence of a pathogen.

The human acquired immune system has evolved to be highly specialist and target-specific such that it is able to distinguish between subtly different pathogens. Two key cell types – T cells and B cells – are involved. Together these cells directly kill infected cells by 'learning' to produce specific antibodies to neutralise the pathogen. These cells even keep a 'memory' of previously encountered pathogens, including viruses, for use when future infections strike. It takes time to activate the acquired immune system, however, and while innate immunity occurs within a few hours, acquired immunity takes days to launch.[2]

Aging has a profound effect on the human immune system. Generally speaking, innate immunity is more active at younger ages and acquired immunity builds up over time. However, older age is associated with a general decline in immune function. The innate and acquired immune systems tend to respond more slowly and less efficiently to pathogens as people age. Low-grade chronic inflammation is also more common among

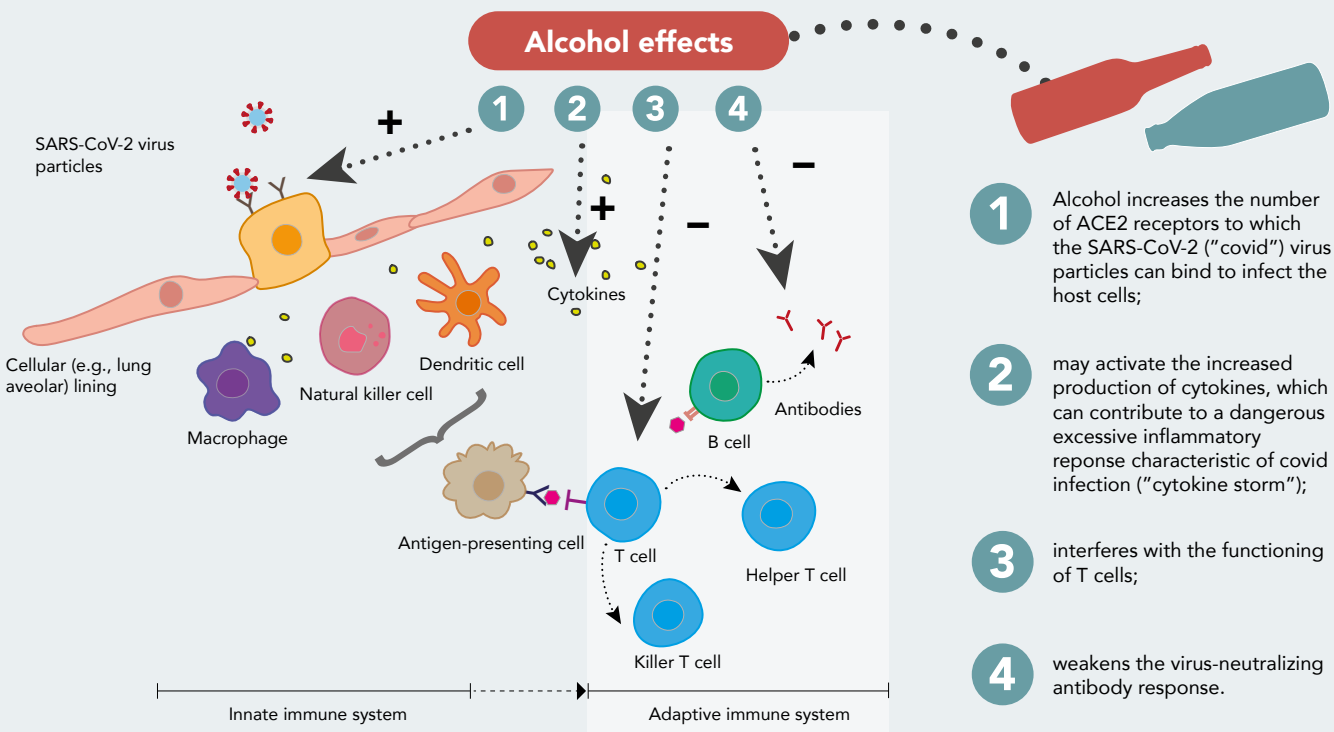
Alcohol use may both reduce immunity to an infection and also increase the risk of serious complications by triggering an excessive immune response.

older people and this tends to have a dulling effect on the immune system. These common consequences of ageing make it more likely that an invading pathogen or virus – such as COVID-19 – will gain the upper hand and cause serious disease.[3,4]

There are several reasons to be concerned that alcohol use might compromise both innate and acquired immune responses to coronaviruses:

- Alcohol increases the number of receptors in the lungs, digestive system and heart that provide the main entry points for coronavirus-type infections such as SARS.[5, 210, 211] This likely results in an increased susceptibility to coronavirus infections generally, including COVID-19.
- Alcohol use may increase susceptibility to COVID-19 infection and complications through its effects on monocytes and 'natural killer' (NK) cells known to play a key role in COVID-19 infections, as well as its role in a process known as 'hyper-inflammation' i.e. an overreaction of the immune system.[6,7] An episode of heavy alcohol use will initially increase an inflammatory response and, later, reduce the activity of cells involved in immune responses.[8] Thus, alcohol use may both reduce immunity to an infection and also increase the risk of serious complications by triggering an excessive immune response.
- Alcohol use may also impair a person's ability to develop immunity to infection. Alcohol has been shown, for example, to interfere with the production of T- and B-cells and reduce blood concentrations of key antibodies involved in acquired immune system responses.[6,7,9–11]

FIG 1 Possible pathways for alcohol's role in activation and inflammation in COVID-19 disease, modified from Golchin et al.[12]



1.2 Specific organs and body systems

Alcohol use is well established as a significant risk factor for many health conditions associated with worse outcomes and complications from COVID-19. Alcohol adversely affects multiple organs and body systems, including the liver, heart and lungs, and the more alcohol consumed the worse the effects. It follows that the combined effects of alcohol use, particularly heavy use, and COVID-19 on these systems will increase susceptibility to serious complications and likelihood of death.

Lungs

Heavy alcohol consumption increases the risk for lung infections, both viral and bacterial.[212, 213] It may also increase the severity of Acute Respiratory Distress Syndrome (ARDS) and risk of permanent lung damage[5] through many mechanisms and pathways. For example, chronic heavy alcohol consumption both increases ACE2-receptor expression in the respiratory system (a main pathway for coronavirus-type entry and infection) and inflammatory responses. As discussed above, heavy alcohol use also compromises both innate and acquired immunity to infection. In combination, these factors may lead to increased susceptibility to infection, severity of infection and subsequent lung damage which may be long-lasting.[5] In support of this, a recent study of permanent lung damage following COVID-19 infection found that presence of alcohol use disorder was a significant risk factor for pulmonary fibrosis, in addition to older age, co-morbidity and smoking.[13]

Liver and digestive system

When alcohol enters the body, its first interaction is with the alimentary canal. The process of alcohol metabolism (oxidative and non-oxidative) induces gut inflammation which impairs mucosal immunity and affects the mucus barrier as well as the epithelium, which permits virus and other microbes to reach the liver through the portal vein. This initiates bacterial overgrowth, dysbiosis



PHOTO: MUFID MAJNUN / UNSPLASH

and altered mucosal immunity, which can result in systemic inflammation and liver damage.[14–16]

Both heavy alcohol use, especially chronic continuous use, and COVID-19 infection are known to occasionally result in some form of serious liver damage. It follows that the combined effects of alcohol use and COVID-19 infection could create a very serious risk for liver dysfunction. A noticeable incidence of liver damage accompanied by abnormal ranges of liver derived enzymes and proteins has been reported during COVID-19 disease.[17,18] Different mechanisms have been suggested for liver injury during COVID-19 infection including immune-mediated hepatitis, direct effects of the virus, drug-induced liver injury from medications used to treat COVID-19, infection-induced systemic inflammation, hepatic congestion secondary to mechanical ventilation and pre-existing liver disease.[17]

Patients with liver cirrhosis are also at increased risk of infections and associated complications due to cirrhosis-associated immune dysfunction, which may add to the

increased mortality from COVID-19 seen in people with cirrhosis compared to those without cirrhosis.[19] A study from India found a greater chance of serious complications and mortality among COVID-19 patients with predominantly alcohol induced liver cirrhosis and liver failure.[20]

However, there is mixed evidence from two studies of non-alcohol induced liver disease in terms of increased risk of complications after contracting COVID-19. A relatively small study from China did not find significant increased risk of complications[21], while another larger study from the US found that patients with a history of non-alcohol-related liver disease were significantly more likely to be hospitalised.[22]

Heart and cardiovascular system

There are many pathways for cardiovascular damage by COVID-19 to occur including: increased clot formation, vasculitis, vascular fibrosis, myocarditis and pericarditis.[23] These may result in heart failure, arrhythmias, cardiogenic shock, as well as inflammatory and coronary illnesses. There is a notable correlation between cardiovascular disease and COVID-19 severity with hypertension and diabetes, but no studies have looked at the effect of alcohol consumption in this context.[24]

Brain

Heavy alcohol consumption is known to change immune response in the brain's frontal cortex and increase pro-inflammatory signaling. Heavy alcohol use can also affect the permeability of the blood-brain barrier. It is plausible that abnormal alcohol-induced inflammatory cytokine release (innate immune response) could increase the likelihood of excessive inflammatory responses observed in patients with severe COVID-19. If this is the case, disease severity may be enhanced. Disruption of the blood-brain barrier associated with chronic alcohol use may also increase the possibility that invading pathogens, including COVID-19, infiltrate the brain.[25]

1.3 Psychiatric conditions and mental health

Serious complications from COVID-19 infection, as opposed to the other major recent coronavirus pandemics, SARS and MERS, is primarily (but not exclusively) a problem for older people, and the majority of hospital admitted patients are above 70 years of age.[26–28] People with dementia are at greater risk of developing neuropsychiatric symptoms when infected by COVID-19.[29] In this context it is important to recall that alcohol is recognized as a powerful neurotoxin, known to cause or contribute to a wide range of neurological disorders including dementia, with risks increasing with age.[30] Recent research also suggests that regular alcohol use, even at low levels, diminishes brain volume and increases brain ageing.[31]

The scientific literature on direct psychiatric effects of COVID-19, as opposed to general psychological distress caused by the pandemic and its restrictions, remains limited. Previous studies on MERS and SARS, however, have demonstrated a range of neuropsychiatric disorders such as encephalopathy, mood changes, psychosis, neuromuscular dysfunction, or demyelinating processes.[32]

A recent systematic review and meta-analysis published in July 2020, where the indirect effects of coronavirus infections on the mental health of people who are not infected were excluded, focused on psychiatric signs or symptoms and symptom severity, with diagnoses based on established diagnostic manuals. Common symptoms among hospital admitted patients for SARS or MERS were confusion, depression, anxiety, impaired memory and insomnia. In the post-illness stage, 32.2% suffered from post-traumatic stress disorder.[33]

When data for COVID-19 were analyzed, a high proportion of patients treated in intensive care were found to be confused (65%) and agitated (69%).[33] One study found that 33% had a "dysexecutive syndrome", which encompasses cognitive, emotional,

and behavioral symptoms, at discharge.[34] It should be noted, however, that a prolonged ICU stay in itself is a risk factor for psychiatric disorders, especially delirium.[35] Furthermore, COVID-19 survivors return to a society in deep crisis, sometimes with enforced social isolation. Their countries, neighborhoods and families may be unable to meet basic needs, including food and medical supplies, due to supply chain problems or loss of livelihood. Other countries may be enforcing strict lockdowns and physical isolation – conditions that may further increase the risk for psychiatric complications. A British survey of non-infected people, for instance, found that almost one in five adults (19.2%) were likely to be experiencing some form of depression during the pandemic in June 2020; this had almost doubled from around 1 in 10 (9.7%) before the pandemic (July 2019 to March 2020).[36]

Another study of psychiatric presentations to 20 emergency departments (ED) across the U.S. Midwest during lockdown reported a large drop (61%) in the proportion of all behavioral health complaints coded as suicidal ideation. Conversely, the proportion of all behavioral complaints coded for alcohol increased somewhat (28.2% to 33.5%). The authors noted that it was very difficult to determine the extent to which apparent declines in ED presentation for suicidal ideation reflected real declines in the population or was a result of fewer people seeking – but still requiring – emergency mental health assistance due to the stay-at-home order. This will become clearer when presentation rates can be compared against general population suicide rates. Alternatively, it is plausible that social distancing might have reduced stressors related to suicidal thoughts or led large numbers of sufferers to use on-line or tele-help services.[37]

The full extent to which alcohol use has affected individuals with pre-existing or newly acquired mental health conditions, either as a direct result of infection or a result of social and economic changes wrought by the pandemic, is yet to emerge. It is reasonable to anticipate, nonetheless, that given alcohol's known short and long-term cognitive effects, there is significant scope for deleterious impacts, particularly among older people, those with dementia and possibly also people with mood disorders.

1.4 Epidemiological studies and methodological challenges

A key concern regarding our current understanding of alcohol's role in COVID-19 infection, transmission and disease progression, is that most large studies have not addressed alcohol use and drinking patters (e.g. levels and frequency of drinking) or the presence of alcohol use disorders at the time of infection, as risk factors. Unfortunately, this leaves some aspects of the relationship between alcohol and COVID-19 so far relatively unexplored. We discuss here on some early, suggestive findings.

A review of 34 studies found that in patients with severe or fatal COVID-19, the most prevalent chronic comorbidities were obesity and hypertension followed by type 2 diabetes, cardiovascular disease, respiratory disease, cerebrovascular disease, malignancy, kidney disease and liver disease, but alcohol use was not investigated.[38]

For future studies, a complicating factor in determining whether there is a causal pathophysiological pathway between alcohol and the effect of COVID-19 infection may be the frequent co-occurrence of other major risk factors that have both independent and inter-related effects. Obesity for instance, is not only a significant risk factor for a severe course of COVID-19, but also for hypertension and type 2 diabetes; heavy drinking is a risk factor for all three of these conditions. Each of these conditions are also considered individual risk factors (i.e. without the necessary presence of other risk factors) for a severe course of COVID-19. The mechanisms for an association between obesity and COVID-19 remains unresolved, but a possible explanation is that the virus not only accumulates in



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PHOTO: KELLY SIKKEMA / UNSPLASH

adipose tissue, but that adipose tissue is also an origin for the inflammatory response.[19]

In a cohort study of nearly 400,000 participants, including 760 hospitalisations for COVID-19, heavy alcohol use (assessed several years before) was not associated with an increased risk for COVID-19 infection or hospitalization.[39] Notably, it was common for participants to have stopped drinking before the study due to prescribed medication and underlying health conditions which could mask increased risk due to alcohol.

A review of substance use disorders and COVID-19 found that people with such disorders are at greater risk of worse COVID-19 outcomes. Factors that increased risk included stress, pre-existing cardio-pulmonary conditions, compromised immunity, factors related to health care, lack of social distancing and wide relaxation of restrictions on alcohol sales, particularly on-trade.[40] A US case-control study found that alcohol consumption (ever versus never) increased the risk of testing positive for COVID-19 by 42%, although whether this was due to those in the 'ever' group having a higher frequency of exposure to high-risk settings (e.g. pubs, nightclubs, restaurants), as opposed to biological factors, was not studied.[41]

Unexpected reports of apparent protective effects from regular heavy alcohol consumption have also emerged. It has been reported that for people with both chronic lung disease and a history of alcohol or substance misuse, a positive COVID-19 result is less likely.[42] This finding is contrary to what would be expected on the basis of many past studies which have demonstrated a relationship between chronic lung disease and alcohol including pneumonia, tuberculosis, respiratory syncytial virus infection, and acute respiratory distress syndrome (ARDS).[43] It is possible that this apparent protective effect was an artefact of reduced social circulation and extra precautions taken by people with chronic lung disease, since the study only examined the likelihood of a positive test result rather than severity of disease.

A UK study also found that red wine consumption was associated with decreased likelihood of testing positive for COVID-19.[44] However, like many other observational studies involving self-reported alcohol use[45], it is likely that apparent protective effects of red wine are due to other protective factors common among people who regularly consume red wine (in this case, 52% of the adult population) e.g. diet and socioeconomic status.

1.5 Cognitive-behavioral effects of alcohol and drinking context

Alcohol has a profound impact on transmission of COVID-19. At this point, much of the evidence for increased risk associated with alcohol is around behavioral effects on drinkers, and the characteristics of drinking settings or contexts (i.e. social factors, entertainment activities), rather than direct physiological effects on host susceptibility and transmissibility.

Cognitive-behavioral effects

Most of the behavioral effects of alcohol that impact COVID-19 transmission relate to its acute effects that result in reduced inhibition and increased relaxation at relatively low levels of consumption, and moderate to severe impairment of executive function at higher levels of use. As a very contagious virus, COVID-19 is easily transmitted between people by direct physical contact or through the air, with risk increasing dramatically with closer proximity. This means that mindful individual actions are essential to reducing personal exposure to the virus from others, as well as limiting exposure to others. Thus, a pandemic creates a situation where individuals need to be aware of increased personal risk and take effective preventative actions, including frequent hand washing, sneezing and coughing hygienically, and maintaining social distancing. Critically, social distancing – the most effective strategy currently available for reducing personal risk and containing community transmission of the virus – relies heavily on individuals consciously curtailing normal every-day social interactions that involve physical contact (e.g. shaking hands, hugging) or close proximity to one another (e.g. shared transportation, office space, social dining, dancing).

Alcohol, one of the world's most commonly consumed psychoactive substances, has long been known to reduce inhibition even at low levels and impair judgement starting at moderate levels. These cognitive effects are established risk factors for a range of negative social harms including impaired driving, violence, sexual risk taking and injuries. Alcohol intoxication, in particular, increases sexual risk-taking, aggressive behavior, and the risk of motor vehicle accidents.[46] Supported by laboratory studies with humans and animals, it has been theorized that alcohol undermines judgement and inhibitory behaviors by narrowing drinker focus onto provocative or instigatory information at the expense of inhibitory cues.[47] Several studies of adolescents and youths exposed to different doses of alcohol (blood alcohol contents ~0.06–0.09%) for instance, demonstrate impaired inhibitory control on a variety of response inhibition tasks.[48,49]

Alcohol exposure also impairs performance and cognitive processes such as memory, ability to focus attention, and planning, even at low levels. While alcohol intoxication has been shown to impair judgment, laboratory studies of perception, motor skills and cognitive performance show that decline begins with BACs >0.0, that is, even after the first drink.[50–52] This suggests that alcohol can lead to poor decision making well before intoxication is perceived or the drinker feels 'drunk'. This could lead to behaviors considered undesirable under pandemic conditions such as hugging each other or simply standing too close to others.

Drinking contexts

Several common drinking contexts interact with the acute cognitive and behavioral effects of alcohol on drinkers in manner



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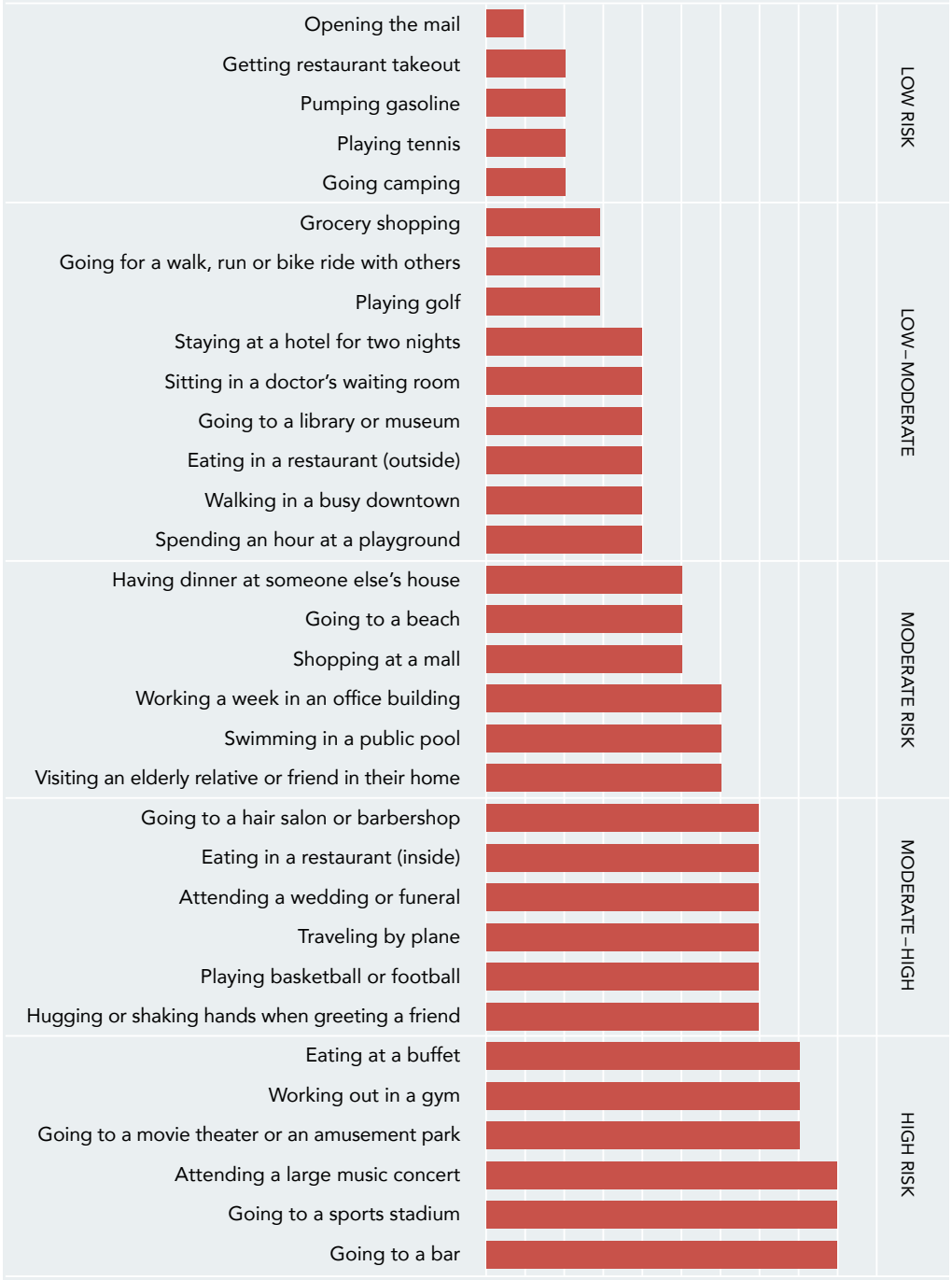
that is likely to exacerbate transmission of COVID-19. These include going to bars and clubs, attending college or university parties, or attending large private functions. Although these drinking contexts may be considered associated with alcohol consumption, the experience of drinking with others can also be a key motivation for engaging in such activities. In each of these contexts, alcohol consumption may provide the primary rationale for attending settings where alcohol is available (i.e., going to a bar to drink) and/or an exacerbating factor tightly linked (i.e. readily available) to settings where individuals seek out social engagement (e.g., weddings or large private gatherings).

We can consider the act of attending a nightclub as an example of a high risk social behaviour in which alcohol plays a central role in elevating risk of COVID-19 transmission. Nightclubs involve high concentrations of people circulating in an indoor space, ensuring relatively close proximity to a large number of other individuals in a confined area. Like many other shared indoor spaces (including offices, hospitals, schools), ventilation may be poor and the rate of air exchange (i.e. swapping stale inside air for fresh outside air) may be limited.[53] Those who are drinking cannot wear masks, and the disinhibiting effects of alcohol may further reduce conscious social distancing behaviours. Further, increasing the risk of transmission, loud noise and loss of inhibition may lead drinkers to move closer to one another, shouting to be heard, perhaps also while singing or dancing or engaging in other forms of exertion (potentially increasing respiration rate and forced expiration). Furthermore, frequent physical contact with other patrons and touching of surfaces (table tops, bar glasses) may present additional risk for transmission. Finally, because most club patrons are unlikely to be known to one another, those feeling unwell may be less concerned about possible COVID-19 transmission than if they were attending a gathering within their own social or family networks.

These theoretical concerns are reinforced by the numerous reports and studies documenting that alcohol-centric social contexts have played a crucial role in 'super-spreader' events, amplification of the outbreak early in the pandemic, and later resurgence after initial control. COVID-19 transmission on the East Coast of the U.S., for example, was initially fueled by a large private party in Connecticut[54] and a biotechnology conference in Massachusetts[55]. The resurgence of COVID-19 in many countries has been linked to the re-opening of bars and nightclubs, music festivals, motorcycle rallies, and campus parties with the resumption of college, among other examples. Conversely, closing or restricting access to bars and nightclubs has been linked to significant declines in transmission and slowed community spread.[56–59]

Acute behavioral effects from alcohol and social contexts involving the use of alcohol (often to the point of impairment) may be most impactful in terms of COVID-19 transmission. Nevertheless, heavy alcohol use and alcohol use disorder are also worth considering because behavioral and socioeconomic risk factors for these behaviours/conditions also appear to be risk factors for COVID-19.[60] For example, those with severe alcohol use disorder may be more likely to be poor, have chronic medical conditions, smoke, and have unstable housing or live in crowded conditions such as shelters, all of which are risk factors for incident COVID-19 infection and possibly worse outcomes among those who become infected. In addition, those with less severe alcohol use disorders but who nevertheless are heavy drinkers (constituting the majority of people with alcohol use disorders), even in the absence of acute use, are more likely to be afflicted with neurodegenerative conditions or mental health problems. Executive functioning (decision-making and judgement) may also be affected to the extent that consistent engagement in protective behaviors such as maintaining social distancing and proper mask wearing and hand hygiene are more difficult.

FIG 2 On a scale of 1 to 10, how risky is...



SOURCE: Texas Medical Association



PHOTO: LOGAN WEAVER / UNSPLASH

2 Population level alcohol use, related social harms and the pandemic

At a whole-of-society (i.e., population) level, whether or not overall alcohol use stays the same, decreases or increases during the pandemic and into the longer-term, will depend on a wide range of factors that will vary among drinking cultures, governments and countries. Nevertheless, established 'availability' theory, in combination with studies of how drinkers have responded to major social upheaval or crises in the past, provide valuable insights into how drinker populations are likely to respond.

Decades of scientific research point to policy and regulation responses that can influence alcohol's 'availability' during the pandemic as fundamental to determining the direction and magnitude of change in alcohol consumption and related harms at a population level.[61–63] There are both economic and physical aspects to alcohol availability. All else being equal, economic availability is higher when retail prices are lower relative to disposable income (i.e. alcohol is more affordable). Physical availability is higher when ease of access is greater such as when numbers of outlets increase or hours of sale are extended. When availability changes also affect where and how alcohol is consumed (e.g. by shifting drinking from bars to homes), then it can also lead to changes in how alcohol-related harm is expressed (e.g. less public violence but more domestic violence). Effects of change in availability may also vary across sub-populations (e.g. gender, age, socio-economic status) depending on related underlying risks (e.g. mental health problems) and drinking patterns (e.g. low-level regular use, episodic heavy drinking).

Also key to determining the pandemic's effect on population-level alcohol consumption are the strong inter-relationships between alcohol use, particularly heavy use, psychological distress or mental health problems. Substance use and mental health problems co-occur frequently and it has been argued that effective treatments and prevention strategies need to consider both aspects of the relationship in order to be effective.[e.g. 64] It is likely, therefore, that the extent to which the pandemic exacerbates pre-existing mental health problems or leads to newly emerged problems, will also have considerable bearing on population alcohol use, although not necessarily in a manner that is evenly distributed among sub-populations.

Two recent studies support the importance of economic and physical alcohol availability as well as mental health concerns in determining the pandemic's effects on population level alcohol consumption. De Goeij et al.



Decades of scientific research point to policy and regulation responses that can influence alcohol's 'availability' during the pandemic as fundamental to determining the direction and magnitude of change in alcohol consumption and related harms at a population level.

(2015)[65] and Rehm et al. (2020)[66] examined impacts of past economic (e.g. recessions) and public health (e.g. the SARS outbreak) crises on population level alcohol use. They identified psychological distress, level of income/budgetary constraints, and changes to price and/or physical availability of alcohol as key predictors of consumption. In relation to the COVID-19 pandemic therefore, a range of outcomes are possible depending on how and in what combination, these key 'mechanisms' are engaged. For instance, elevated psychological distress in a community may lead to some increasing their alcohol use, but this may be countered by an overall reduction in physical access to alcohol through alcohol sales bans or an overall increase in price. Another scenario might involve shutting down all on-trade functions of bars and restaurants (i.e. dine-in food and alcohol service) while, at the same time, lifting their off-trade alcohol sales restrictions. This would effectively increase the total number of off-trade outlets, as pubs and restaurants are enabled to sell alcohol via take-away and home delivery services, with or without provision of food. This might only lead to a slight increase in consumption overall but a large increase in the amount of alcohol consumed in the home.



FOTO: OSCAR SODERLUND / UNSPLASH

2.1 Population-level alcohol consumption before and after the pandemic

Pre-COVID-19, between 1990 and 2017, per-adult global alcohol consumption increased substantially by 10% (5.9 L pure alcohol to 6.5 L). Manthey et al (2019)[67] predicted that the upward trend would continue, and that by 2030, global consumption would increase by a further 17%, reaching 7.6 L. The prevalence of current drinkers was also projected to rise (45% in 1990 to 50% in 2030), while the prevalence of lifetime abstainers was expected to decline (46% to 40%). Prior to the pandemic, therefore, it was clear that worldwide numbers of drinkers and total alcohol consumption were on the rise.

Alcohol use causes a substantial burden of global mortality and morbidity[68], the true extent of which may not yet have been fully realized.[45,69] Further increases in total and per-capita use will, in all likelihood, present further challenges for public health, safety and the burden that alcohol places on society. Further, as discussed previously in this report, due to its various physiological and behavioral effects – heavy use and intoxication in particular – alcohol may increase vulnerability to COVID-19 infection, severity and enhance transmission of the virus.

At the present time and based on available data, it is premature to conclusively determine, or to easily characterize, how total consumption or patterns of use have changed during the pandemic. What is almost certain, however, is that there will be substantial variability in how populations respond depending on the form and magnitude of the key mechanisms described above.

Documentation and analysis of the impacts of the pandemic on alcohol consumption levels and patterns are complicated by wide variations in pre-pandemic consumption levels and drinking patterns between regions. Interpretation also needs to take account of variations within regions by gender, age and a raft other factors including the extent to which COVID-19 has impacted on social and economic functioning. In addition, in any one

location, consumption may shift over time due to changes in alcohol policies. On a more fundamental level, capacity to examine COVID-19 effects on population level alcohol use will depend heavily on how alcohol consumption is measured (e.g., independently reported alcohol sales data vs. self-report survey data), the quality and timeliness of the data and indeed, whether data are available at all.

Self-report surveys

The development of consumption varies in different parts of the world. For some people isolation, boredom and anxiety have led to increased drinking where alcohol has still been available. For others the loss of income and reduced access to alcohol has led to reduced consumption. Alcohol consumption surveys during the pandemic have largely focused on whether respondents have increased or decreased their drinking in recent times. Although these data preclude conclusions regarding quantitative assessments of population-level alcohol use and tend to be from high-income countries, they are nonetheless informative. Surveys have largely shown a higher percentage of respondents increasing their drinking, as opposed to decreasing. For example, in Canada (20% increasing v. 10% decreasing), Germany (35% v. 19%), the U.S. (39% v. 12%) and the U.K. (43% v. 15%).[70–73] The Global Drug Survey[74] also reported increased consumption by 36% of respondents and decreased consumption by 22%, although available data were scarce and limited to 20 countries with generally high-income. Conversely, an online survey conducted in nine European countries reported 36% of respondents had decreased alcohol use and less than 10% had increased.[75] Similar results were found for Norway.[76]

In Australia, self-reported changes in consumption tended overall towards increased use, and were much larger for women than for men. For women, caring for dependent children was a major predictor of increased alcohol use, whereas for males, loss of employment or reduced work hours were predictive. However, accounting for a range of demographic, socio-economic and geographic differences among respondents, it was the presence of psychological distress since the advent of the pandemic that most strongly predicted increased alcohol use.[77] Recent accounts from Scotland concur regarding the association between pandemic-related stress and increased alcohol use, particularly among vulnerable drinkers, i.e. people who already drank at higher levels before the pandemic.[78] Commentary from local health and research sectors also points to increased consumption being facilitated by increased physical availability of alcohol in the form of heavily marketed off-trade sales and unfettered home delivery services.[79] A nation-wide survey of 3,000 U.S. employees working from home reported that about one third believed they would drink more alcohol during lockdown or self-isolation than under normal conditions. A similar proportion said that when working from home they were more likely to drink alcohol during work hours compared to their usual work place.[80]

Alcohol sales

Beyond surveys, alcohol sales data (where available), also provide an avenue for identifying potential consumption changes. Official national sales data are typically reported annually, and are therefore not yet available for the pandemic period. However, some information can be gleaned from industry documents such as volume-based sales reports of two large alcohol companies, AB InBev and Diageo. According to interim reports for the six months ending June 2020, AB InBev incurred a 13% decrease in alcohol volume sold compared to the same period in the previous year.[81] Diageo reported a similar decline of 11% in sales volume.[82] It is difficult to infer changes to total alcohol consumption, as alcohol users may pivot to cheaper or unrecorded forms of alcohol. These sales-based declines differed substantially by region. AB InBev, for instance, reported a 3% decline in North America and a 22% decline in Asia Pacific. Likewise, Diageo's North American sales indicated the greatest stability, dropping



Also central to any consideration of the extent to which alcohol contributes to the total health burden on society is the degree of burden that these outcomes incur to public health services.

only 1% compared to declines of 30% or more in all other global regions.

In Sweden, recorded sales from the retail monopoly Systembolaget increased by about 12% in the January-June period[83], however, there was also a large drop in unrecorded sales (such as personal imports). Overall consumption is estimated to have decreased by 7% during March and April.[84] Both the Norwegian and Finnish alcohol monopolies have reported large off-trade sales increases, but in Finland this has been balanced by much less drinking in on-trade locations, such as bars and restaurants.[76,85]

Country-specific sales data provide snapshots of alcohol purchasing patterns, but short time periods undermine their usefulness as sold alcohol may not be immediately consumed. In many countries where there was a possibility of liquor stores being deemed 'non-essential' a temporary, large sales peak was observed that likely represents a stockpiling effect. Reports from March 2020 show large increases in weekly sales compared to previous years, e.g. +54% in the UK[86], +40% in Canada[87], +34% in Australia[88] and +55% in the U.S.[88] However, in most cases sales fell back to approximately historical levels after initial panic buying had ceased.

Modes of sale and access to alcohol

As above, at this point in the pandemic, it is difficult to definitively discern whether alcohol consumption has increased, decreased or perhaps even remained stable in a given population. That said, in many countries there have been obvious changes to the ways in which alcohol can be accessed, at least temporarily, and the locations where it can be consumed.

Many lockdowns have included closure of on-trade outlets (bars and restaurants) and shifted purchasing towards off-trade outlets (take-away shops). This has correspondingly shifted drinking away from on-trade venues and into private residences. There have been reports of very large online sales increases facilitated by rapid emergence of wide-spread home-delivery services. Reports in the UK,[89] US and Australia[88] indicate online sales increases beyond 200%. For some regions, these newly emerged modes of sale are entirely novel, such as take-away service from bars and restaurants in areas where home delivery was not previously available, e.g. West Bengal in India has begun allowing alcohol delivery services. In Sweden too, a number of municipalities have permitted licensed outlets to provide take-away alcohol, in conflict with current alcohol legislation[90]; decisions from the courts are pending.

In summary, as expected, impacts of the pandemic on alcohol consumption across regions have been variable – in keeping with equally variable responses by government decision makers, pre-pandemic drinking patterns and societal norms. There is also emerging evidence of divergence among drinker groups within regions related to pre-pandemic drinking patterns and psychological distress. Perhaps of greatest importance, however, will be how these changes play out in the longer term. The most significant long-run changes in alcohol consumption and related harms are likely to be driven by changes to alcohol policy that have occurred in response to the pandemic. This will be particularly true in cases where regulatory polices loosened 'temporarily' during the pandemic are not swiftly returned to pre-pandemic status.

2.2 Alcohol-related social harms

Many harms related to alcohol use extend well beyond the physical health and wellbeing of the drinker and this is no less true in the context of the COVID-19 pandemic. Alcohol-related social harms are a function both of the amount of alcohol consumed, and physical and social contexts in which that consumption occurs. Alcohol-related harms are typically conceptualized as having a strong social aspect including such outcomes as interpersonal violence, domestic violence, child neglect and abuse, pre-natal alcohol



PHOTO: REX PICKAR / UNSPLASH

exposure, and injuries, especially those incurred through impaired driving. Also central to any consideration of the extent to which alcohol contributes to the total health burden on society is the degree of burden that these outcomes incur to public health services.

Stranger-to-stranger violence

There is scant information available at this time on how alcohol and stranger-to-stranger violence might be affected by a pandemic. However, it is possible that alcohol-related interpersonal violence, especially in public spaces, has decreased due to 'shelter in place' directives or 'lockdowns' with requirement to remain at home, the closure and/or restrictions on restaurants and bars in many countries. Social distancing directives that require people to maintain minimum distance from one another (e.g. 1.5, 2.0 meters) may have also reduced access to on-trade alcohol and opportunities to drink publicly in contexts (e.g. crowded bars) where violence between strangers and non-family members occurs more frequently. As such restrictions are relaxed, at the very least, countries are likely to experience increases in stranger alcohol-related violence similar in scale to pre-pandemic levels.

Violence, abuse and maltreatment in the home

There is considerable evidence that domestic violence and intimate partner violence, especially against women, increase when drinking is present. This is described in detail in our 2017 report, *"Alcohol and Violence"*.[91] Evidence is emerging that during the pandemic, as countries have been limiting people's opportunity to go out from home, domestic violence has increased. For example, one report finds that there has been a 60% increase in calls for emergency services in European Union member states and a five-fold increase in violence prevention hotlines.[92] Another study found that 911 calls in the city of Chicago increased with time spent at home, and that while general calls for police services declined, domestic-related calls for police service increased. This was found to be at odds with official statistics

60%

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31

The United Nations Population Fund estimated that there would be an extra 31 million cases of gender-based violence globally if lockdowns continued for a further 6 months, but the role of alcohol consumption in these forecasts was not considered.

which reported decreases in both types of calls. Even so, the official arrests for domestic violence crimes showed a decline of an order of magnitude smaller than declines in non-violent crimes. Overall, the authors estimated that nearly 1,000 domestic violence crimes went un-reported between March and April, 2020.[93] The United Nations Population Fund estimated that there would be an extra 31 million cases of gender-based violence globally if lockdowns continued for a further 6 months[92], but the role of alcohol consumption in these forecasts was not considered.

Across the globe, reports of increased violence against children during the lockdowns are surfacing.[94,95] One hospital in London reported a 1,500% increase in suspected abusive head trauma among young children between 23 March and 23 April 2020 compared to the same period during the previous 3 years; this was the same period during which the United Kingdom underwent national self-isolation.[96] Reported cases of child maltreatment may also have decreased in some places, possibly as a result of abrupt reduction in contact between children, educational personnel (teachers), and other community workers.[97] Some commentators suggest that the well documented vast increases in calls to domestic abuse and child support telephone lines, and feedback from local authorities is a worrying indication that many cases of child maltreatment are being 'missed'.[98] Most likely, child abuse has also increased, but as schools and child care units are central to detecting and reporting abuse, the closure of these facilities has probably contributed to substantial under-reporting.

Alcohol's specific contribution to these increases is not yet known, however, there are at least four reasons to suspect that it has been substantial. First, there is an established body of pre-pandemic research supporting alcohol's role in domestic violence, child abuse and child maltreatment.[69] Second, within the context of COVID-19, a narrative review[99] singled out increased alcohol use as a precipitator and intensifier of intimate partner violence. Third, increased psychological distress arising from changes in work-life and child-care responsibilities as well as financial hardship experienced by many during the pandemic, may contribute to increased alcohol use and potential for harms to other family members. And fourth, due to lockdown restrictions in many countries, a higher proportion of alcohol use is occurring in the home than during normal times and this may contribute to diminished capacity for child supervision accompanied by having more drinking adults in the home and for longer periods.

In summary, given the established relationship between drinking in the home and domestic violence, it is reasonable to conclude that alcohol continues to contribute to such violence during the pandemic, and that this has likely increased due to major changes in social and economic conditions. Family members have much additional time at home, and a far higher proportion of alcohol use is occurring in the home due to lockdown restrictions. Boredom, unresolved family issues and family tension, psychological distress, stress related to increased caregiving responsibilities (e.g. closure of schools and child care centers leading to homeschooling) and unproductive down-time may all contribute to changes in relation to where, when and how much alcohol is consumed and related harm that ensues to others in home.

Pregnancy and prenatal alcohol exposure

Birth rates have been affected differently in different parts of the world during the pandemic. Decreased access to prenatal health care and contraceptives may increase the rate of unplanned pregnancies in developing countries, while economic downturns often lead to decreased birth rates in developed countries. In surveys from Europe and North America, women appear to have been delaying pregnancy or planning to have less children since the pandemic began.[100,101] Reports on changed sexual behavior in relation to alcohol, such as reductions in alcohol-related sexual consequences and risky sexual behavior have also emerged.[102]

Prenatal alcohol exposure is the leading cause of neurodevelopmental damage, learning disabilities, and behavioural problems, but is also the most under-acknowledged and misdiagnosed neurodevelopmental condition. There is some concern that the COVID-19 pandemic may lead to an increase in alcohol-related fetal harms. Women in developing countries may be at particularly high risk of unplanned pregnancies due to shortages or difficulties accessing contraceptives during the pandemic. At the same time, alcohol consumption during pregnancy may be more likely to occur or increase for some women experiencing high levels of psychological stress or fear associated with contracting the disease or restrictions on leaving the home.[103]

In a recent Canadian survey of substance use during pregnancy, almost 7% of women reported using alcohol when pregnant during the COVID-19 pandemic.[104] No clear connection to COVID-19-related concerns was found, however, and prevalence of maternal alcohol use did not appear to have exceeded previous population estimates.[105]

Injuries

COVID-19 infection and alcohol consumption are both known to cause neurological damage. In the case of alcohol, intoxication, with subsequent behavior change, is globally acknowledged to be a cause of injuries e.g., traffic crashes, falls, drownings. As discussed earlier in this report, high levels of alcohol consumption can also compromise the immune system, increase the risk of acquiring COVID-19 infection, and possibly exacerbate the course of infection. As for COVID-19 *per se*, it has not yet been established whether this virus also has behavioral effects, leading to increases in injuries. This is not unlikely considering its toxic impact on the central and peripheral nervous system, including encephalitis; encephalopathy and myalgia, as well as cognitive, emotional, and behavioral symptoms.[106] On the other hand, becoming acutely ill with COVID-19 is likely to lead to acute decreases in alcohol consumption, and also reductions in the types of activities that can lead to physical injuries. COVID-19 also appears to be associated with reduced motor vehicle crashes due to lockdowns and thus reduced need for driving.

The potential for alcohol use to interact with COVID-19 infection in a way that alters behavior and likelihood of injuries, during or after illness, has not yet been studied or reported. However, indirect effects of the pandemic following implementation of restrictions to limit the infection's spread by governments world-wide, have become increasingly studied. An important part of these developments concerns their impact on alcohol consumption and subsequent risk-taking behaviors of drinkers, particularly lack of social distancing.

There are notably large gaps in data collection, assessment and knowledge regarding the pandemic and its impact on various forms of injury (e.g. falls, drownings, burns). At this time, the area with the best available data is traffic. Traffic crashes overall have been reduced in a number of countries, following a reduction in traffic density as a result of travel restrictions and general slowdown of the economy. Mandated societal lockdown policies appear to have led to reductions in non-serious road traffic accidents (resulting in no injuries), but the rate of serious or fatal injuries per miles driven or per crashes have increased in several countries.[107]

In Florida, New York, and Massachusetts, for instance, general downward trends for vehicle collisions and vehicle-related injuries have been reported.[108] In another US study, overall traffic fatalities were reduced, but the fatality rate per vehicle miles traveled increased somewhat.[109] In Finland, alcohol-impaired driving offences have reportedly increased.[85]

Rates of alcohol-impaired driving across different regions are subject to some uncertainty, in part due to the COVID-19 pandemic itself. In Sweden for instance, random road-side testing for alcohol by police was abandoned to reduce the risk of infection transmission.[110] Reported reductions in alcohol-impaired driving during the COVID-19



In addition to the role of alcohol as a risk factor for spreading infection and increasing risks of complications, alcohol contributes to over 400 varieties of illness and injury thus placing a considerable burden on healthcare.

pandemic are therefore difficult to interpret as they may be simply due to a reduced police enforcement presence.

Adulterated alcohol

Fatalities from consumption of adulterated alcohol, often containing methanol or other toxic additives, have been reported from several countries, e.g. Mexico[111] and India[112]. This may be a consequence of restricting availability to regular alcohol during the pandemic. Problems with adulterated alcohol have occurred frequently prior to the pandemic however. While often highlighted both in media and by the alcohol industry, the problem is small in comparison to the toxic effects of commercially produced alcohol experienced by the population at large.

Burden on healthcare resources

Protection of healthcare resources is a major priority for countries dealing with a pandemic such as COVID-19. In many countries, hospitals and emergency rooms have been overwhelmed by COVID-19 cases when infection rates have soared, both in developed countries (e.g. Italy and Spain) and many others throughout the developing world (e.g. Iran and Pakistan). As outlined above, there are many reasons to be concerned that drinking alcohol and also attending drinking venues, contribute to the spread of the virus through a variety of physiological, cognitive-behavioral and social mechanisms. In addition to the role of alcohol as a risk factor for spreading infection and increasing risks of complications, alcohol contributes to over 400 varieties of illness and injury[113] thus placing a considerable burden on healthcare.

In fact, alcohol's impact on the delivery of health services is significant in most countries. Since the 1980s, over 100 emergency departments (EDs) from 33 countries have participated in an international study of alcohol's contribution to injury.[114] This global study shows that among participating countries, on average, alcohol contributes to 20% of injuries and 11.5% of all non-injury ED presentations. It was estimated, for example, that in 2014 there were nearly 5 million alcohol-related ED presentations in the US[115] while a Canadian study estimated over 700,000 such presentations in 2017[116].

A substantial proportion of hospital admissions are also attributable to alcohol in most countries. Using the International Model for Alcohol Harms and Policies[113], the estimated number of alcohol-attributable hospital admissions for Sweden in 2014 was 59,469[117], 46,016 for Finland in 2016[118] and 105,065 for Canada in 2017[116]. As a proportion of all recorded hospital admissions in those years, these estimates represented 3.8% for Sweden, 6.3% for Finland and 4.3% for Canada. In each of these countries, annual prevalence rates for alcohol-attributable hospitalizations have exceeded COVID-19 hospitalization rates attained in 2020.

One of the main objectives of public health strategies during the pandemic has been to 'flatten the curve' i.e. prevent or delay new cases in order to reduce immediate demand on health services and delay future demand. Indeed, countries that have imposed stringent alcohol restrictions have observed specific reductions in emergency room and hospital admissions over and above the effects of lockdowns [e.g. 119,120]

Despite overwhelming evidence for alcohol's burdensome impact on emergency and hospital resources (including staff), the potential gains to be won from addressing this preventable burden are rarely fully appreciated by governments. Unfortunately, it appears that this continues to be the case, even in the midst of the COVID-19 pandemic and its self-evident impact on healthcare sectors around the world. As an indication of how little awareness there is among decision-makers in some countries of alcohol's impact on healthcare, leaders in some North American jurisdictions announced that they would ensure continued alcohol supply and include alcohol on a list of 'essential' commodities *in order to protect healthcare services*. In Colorado, Ontario and the Northwest Territories of Canada, for

example, governments maintained alcohol supply for the specific purpose of preventing public health facilities being 'overwhelmed' by alcohol dependent individuals going into withdrawal.[121–123] Because hospital admissions for alcohol withdrawal are a small proportion of all those due to alcohol use (for Canada about 5% of all presentations due to alcohol and 0.2% of all hospital presentations[124]) and also because withdrawal admissions decline over time when alcohol supply is restricted [e.g. 125,126], this is not sound reasoning. In fact, maintaining alcohol supply guarantees a continuation of demand for the treatment of alcohol withdrawal along with substantially greater numbers of other alcohol-related illnesses and injuries (See further discussion of alcohol withdrawal and healthcare services below.)

It is reasonable to conclude, therefore, that when acute health crises occur, policy action that increases or maintains population level alcohol use, will likewise increase or continue the demands that alcohol-related harms place on health services, independent of the virus. These demands will continue to occur as acute conditions requiring emergency services and inpatient care for chronic and serious conditions related to drinking. Clearly, appropriate management of public health crises, epidemics and pandemics calls for responsible alcohol policy as a key strategy for reducing pressure on overstretched healthcare resources.

Alcohol withdrawal

Related to the issue of COVID-19, alcohol use and the burden on health care is the issue of alcohol withdrawal. Alcohol withdrawal can occur when an alcohol-dependent drinker abruptly stops (or severely curtails) drinking after a long period of use. A number of governments have imposed total alcohol prohibition as part of efforts to limit the spread of COVID-19. Two major arguments have been advanced for this. The first recognizes that alcohol consumption, with impaired judgement and risk taking behavior, impacts negatively on recommended measures such as social distancing, hand washing, avoiding public transport etc. The other recognizes that alcohol-related morbidity constitutes a heavy burden on health services resources, reducing capacity to address COVID-19 infection.[127]

Concerns have been voiced regarding the potential for total prohibition to increase rates of alcohol withdrawal. Abrupt cessation of heavy drinking is a well-known risk for medical complications: especially seizures and deliria, which untreated carry a high risk of mortality.[128] Even increases in suicides have been reported as a consequence of alcohol withdrawal.[129,130]

It should be noted that alcohol withdrawal constitutes only a minor fraction of the total health burden from alcohol, one that is dwarfed by the burden from conditions caused by continued or increased drinking. The overall effect of prohibition – or other policies to reduce alcohol consumption in a population – is a reduction of acute alcohol-related conditions.[131] Furthermore, most cases of alcohol withdrawal are managed by the heavy drinkers themselves, without seeking treatment. Finally, it is likely that severe reductions in the supply of alcohol would actually lead to long-term reductions in alcohol withdrawal, as it is the continued availability of alcohol that fuels the physiologic dependence that is the predicate for withdrawal. Nevertheless, it is important that imposition of prohibition be combined with advanced warning to the public, as well as to health services so they can be well prepared to manage any increase in alcohol withdrawal cases.

Nadkarni et al (2020) suggested an alternative approach to prohibition in India and other low and middle income countries. This would involve continued access to alcohol, but a stronger emphasis on social distancing for those who want to continue drinking, and combining this with innovative approaches to treatment, including telemedicine.[132]

PHOTO: ANTHONY TRAN / UNSPLASH

3 Government responses to the pandemic and alcohol industry actions

A key element of the pandemic's social and economic impacts in regions throughout the world, has been the responses it has prompted by governments, particularly with respect to alcohol control policies. These government actions have not occurred in a vacuum, but, rather, they have been influenced by underlying and changing public health conditions with respect to COVID-19, citizen and key agency (e.g. health professionals) responses to the pandemic, and alcohol industry actions related to policy and regulation.

3.1 Government roles and responses

Governmental responses to COVID-19 may involve direct alcohol policy action, or may involve general policy actions that have a substantive indirect impact on alcohol control. The nature and severity of partial or complete lockdowns, and whether or not alcohol is considered an essential product or service, can have a similar effect as outright prohibition. Such is the case with India, which had a very strict lockdown generally but which did not designate alcohol as an essential product. This resulted in conditions that were tantamount to a total ban.

There have been a range of government policy responses to the COVID-19 pandemic. While there has been considerable variation between countries, and even within countries, there are strong themes that nonetheless emerge. As an overview, some governmental policy change has involved increasing the restrictiveness of policies, while other policy change has involved liberalizing policy.

On the policy restriction side, some countries or regions within countries have instituted bans on the sale of alcohol. Although bans are controversial, they effectively reduce consumption and can greatly reduce alcohol-related problems. Bans are effective because they severely curtail the physical availability of alcohol, and policies restricting the physical availability of alcohol are generally effective at reducing population-level consumption and related harms. Furthermore, the effect of bans may be magnified by other COVID-related changes such as restrictions on movement or public transport or loss of disposable income.

Countries that have instituted national, regional or local COVID-related bans on the sale of alcohol include South Africa, Georgia, Greenland, France, Thailand, the Philippines and Mexico[66,119,133–136], among others. A hallmark of these bans is that most of them have been relatively brief, and few countries are likely to seriously consider maintaining



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3

Alcohol adversely affects people around the world on a large scale even in non-pandemic times, with about three million deaths attributed to alcohol use each year.

pandemic alcohol bans in the long run. These bans have also occurred more frequently among middle and low income countries than among high income countries.

While total bans on alcohol affect all alcohol sales, a more common policy shift towards more restrictiveness has been in the form of limits or bans for the 'on-trade' sale (i.e., where alcohol is consumed on site) of alcohol. This has been widespread in both high and middle income countries [e.g. 57,137–140], and has become even more common as the on-trade consumption of alcohol at restaurants, bars and night clubs (and alcohol consumption in similar contexts such as college parties or large private gatherings involving alcohol) have been recognized as major factors in 'super spreader' events and in the resurgence of COVID-19. Restricting or eliminating the on-trade sale of alcohol has become more common over time, as opposed to complete bans.

On the liberalization side, a large number of countries, states and territories have moved to declare alcohol an 'essential' product, and off-trade alcohol retailers as essential services. For instance, alcohol retailers were included on the lists of 'essential services' in Canada, New Zealand, and the UK, France, Kenya, Uganda, Rwanda and were allowed to remain open during lockdown.[141–143] Similarly, off-trade establishments were deemed essential business in 42 US states.[137] In the setting of lockdowns prohibiting all but essential services and businesses, this is an important advantage and gives the retail alcohol sector an advantage in competing for discretionary spending of consumers.

Alcohol adversely affects people around the world on a large scale even in non-pandemic times, with about three million deaths attributed to alcohol use each year.[144] The formal designation of alcohol as an essential product, and its sale as an essential service, is a striking indication of the place of alcohol in many countries, even or especially in comparison with other economic entities that were not afforded this status. It also helps explain why governments have been reluctant to increase alcohol taxes in lieu of increasing other tax rates, or of adopting other impactful policies. Even from an economic perspective, the alcohol-related economy, though large, would appear to be smaller than other economic sectors that were not deemed essential.[145] The degree to which the designation of essential was assigned in so many instances may reflect strong lobbying activity and/or the fact that alcohol is the preferred drug for most in the general population, including policy makers.

While on-trade alcohol sales have been restricted in many locations, off-trade sales have been liberalized, particularly in high income countries with relatively comprehensive alcohol control systems.[66,146] This has taken several forms. One is permitting or liberalizing the internet sale and home delivery of alcohol in places where that has been restricted previously. Another is permitting 'take-away' alcohol purchased from on-trade establishments, where in the past it had to be consumed or left on-site. Other policy changes allow 'curbside pickup' where none existed previously, and increased allowances for producers to sell or ship directly to consumers without going through wholesalers or retailers.

Throughout the pandemic, predominant policy activities by governments have been to restrict the sale of on-trade sale of alcohol products, while liberalizing off-trade sales. The final impacts of these changes, with or without controlling for other pandemic-related economic and behavioral effects, will be more fully elucidated over time. How long each of these policy changes last, or the degree to which any pandemic-related changes lead to other changes in alcohol policy, will have an impact. It should be noted that on-premise outlet bans were mostly temporary in nature, and that bars, clubs and restaurants serving alcohol reopened in many countries after initial lockdowns. Conversely, liberalization policies that increase access and convenience for consumers such as internet sales and home-delivery have in many cases been long-sought by industry and seem in step with the e-commerce movement.

As such, it appears likely that many of the liberalized policy initiatives in the COVID-19 era are likely to persist, indefinitely in many cases. It is important to note that the substantial majority of alcohol sold and consumed comes from off-trade sales, including among high income countries, so the net effect may well be negative in terms of the outcomes of excessive drinking and alcohol-related harms.

Finally, governments' interest in economic recovery, generally and in hard-hit hospitality-related industries in particular, is likely to spur further policy liberalization in the future. This is likely to result in adverse public health consequences, an increase in alcohol-related costs to cash-strapped governments, and possibly negative or minimal changes in economic conditions across the entire economy, as opposed to hospitality and alcohol-related industries. However, budget deficits may also spur higher alcohol taxes, where the burden will be perceived to fall on producers and wholesalers and other larger alcohol industry operators, many of whom have seemingly fared better than other commercial sectors during the COVID-19 pandemic.

3.2 Alcohol industry actions (vested interests)

Vested interests, such as those represented by various economic entities associated with the alcohol, tobacco, pharmaceutical and sugar industries, use a range of strategies to influence policy frameworks and regulatory approaches that favour achievement of their objectives. These strategies have been used in full during the COVID-19 epidemic. Beholden to shareholders, addictive industries are motivated by profit-seeking to secure and expand their markets while minimizing future external threats. In the case of the COVID-19 pandemic, obvious external threats might include, for instance, decreased sales as a result of outright alcohol sales bans, comprehensive lockdowns or closure of on-trade outlets and social distancing rules which limit numbers of patrons allowed on licensed premises. External threats may also include research evidence for social activities and contexts where alcohol is consumed as key drivers of the pandemic. If taken up by the general public and policy makers, this could negatively affect the industry's reputation and potentiate policy change that affects sales e.g. designation of on-trade outlets as high-risk for COVID-19 infection, extended restrictions on social gathering numbers and places.

Vested interests seek to create influence and imbed their preferred policy positions at all levels of government and facilitate this by consciously striving to influence social norms and values, science, and the media.[147,148] Often presented in terms of 'a partnership' or 'partnering', arrangements struck between alcohol companies and governments may even go so far as to supplant completely the role of elected representatives in formulating alcohol policy in the public interest. Governments of developing and low income countries appear particularly susceptible to interference by commercial vested interests, although high



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income country governments are by no means immune.[147]

Commercial investment in lobbying efforts to shore-up the scaffolding that supports alcohol industry reach into national, state and local policy is strategic, ongoing and has much in common with Big Tobacco.[149] Strategies for establishing the routes and relationships that lead to policy influence and change may be short-term or take a longer term view. In the latter, continuous efforts are applied to identify, respond to and capitalize on opportunities as they arise in order to shape future policy and regulation or delay public health advances.[149] Vigorously pursued by multi-national and local alcohol companies, the social and economic upheaval wrought by the COVID-19 pandemic appears to have presented one such opportunity.

Evidence of alcohol industry groups applying a range of vested interest strategies has emerged from many sources and in a variety of forms, as described below.

Industry's role in classifying alcohol sales as an essential service

Many governments world-wide have exempted off-trade alcohol outlets and alcohol manufacturers from lockdown conditions strictly applied to other key services such as schools, childcare, transportation, sports and fitness centres. Previous determinations that the off-trade sale of alcohol is an essential service across many countries appears to be rare, if not unprecedented, in history. This is no doubt a major boon for the industry's public image and future prospects for policy influence. Evidence suggests, however, that the decision-making processes underlying the installation of alcohol sales as an essential service have been greatly influenced by political pressures weighted heavily in favour of alcohol producers, manufacturers and distributors.[123,150,151]

In the early days of the pandemic, as unprepared governments grappled with the impending threat of a large-scale public health crisis, it appears that industry representatives were intensely lobbying governments to urgently declare the sale of alcohol an essential service. Opp and Mosier (2020)[123] have published detailed case studies describing how alcohol sales emerged as an essential service in California and Colorado. Similar political processes underlying the designation of cannabis and firearm sales as essential services at various times were also documented. The authors concluded that their findings point to political pressure exercised by multiple actors with conflicting interests culminating in decision makers' maximizing personal political interest – which is not necessarily aligned to public interest – as underpinning alcohol's status as an essential product.

Crucially, public and private lobbying of key decision makers by industry has been strategically accompanied by industry media statements – couched as fact – of the centrality of alcohol to civil society (i.e. essential) and its purported role in good health. For example:

> *"It's [alcohol] a way of life for many Australians and in moderation it's good for your health."*[152] (Australian Grape and Wine AGW)

> *"If we want people to stay at home, if we want them in a good state of mental health with a conviviality that encourages them to adhere to social isolation, we've got to ensure they have access to the social norms such as enjoying a drink."* [152] (Retail Drinks Australia RDA)

To cement perceptions of alcohol's essential status among the general public, politicians and the media, the industry has mobilized a range of supporting strategies. Industry bodies have made repeated claims as to its central economic significance as an employer, its role on the jobs 'value chain'[153–158], and by implication, claimed special status among other sectors. There is some evidence also of industry capitalizing on reported fears of some health practitioners regarding potential alcohol withdrawal among the alcohol

dependent.[123] At the same time, industry has been investing in 'responsible' drinking initiatives,[159–164] pointing to negative public opinion on restrictions[165] and apparent growth in illicit alcohol use[165].

Where governments have attempted to introduce off-trade retail purchase limits during the pandemic period to protect health and safety, industry intervention has reportedly led to substantial watering down or complete removal.

Developments in Australia are a case in point. In Western Australia, the state government introduced temporary restrictions on off-trade alcohol purchases in March and April 2020. In a media statement, the WA Premier announced a limit of 57 standard drinks per person per day and noted: *"Alcohol-related issues take up an enormous amount of resources in our health system. These are resources we simply cannot afford to spare during the COVID-19 situation"*. [166]

Health groups welcomed the policy and its implicit message that alcohol-related harm and social disorder are preventable burdens on society. In response, national retail industry representatives launched sustained pressure on the WA Government to remove the restrictions and replace them with its own voluntary initiative launched nation-wide six days later. Visible vested interest strategies included: media statements framing alcohol as an essential product; claims that limits would further impact the struggling industry and unfairly discriminate against WA businesses; and, complaints that the limits were complex, ineffective, excessively low and would lead to increased frequency of shopping. Some weeks later, the government restrictions were replaced by the industry's voluntary national limit of 150 standard drinks per transaction. Only one week after that, the industry announced it was also dropping its own voluntary initiative.[167]

Largely unquestioned in the popular press and often reported against a backdrop of dire lockdown effects on hospitality workers or panic buying at off-trade outlets, the 'essential' status of alcohol during the pandemic appears to have been met with only minor public debate or scepticism.[168]

Corporate philanthropy and marketing

Highly visible corporate philanthropy such as widely publicized 'donations' are a form of public relations strategy. They are often accompanied by a strong social media presence and advertisements. Throughout the COVID-19 pandemic, campaigns couched in terms of charitable support have been directed at hospitality industry employees affected by lockdowns (e.g. bartenders, restaurant staff), local community relief funds and the establishment of buy-in-advance 'voucher' schemes to stimulate consumer purchasing. [e.g. 169,170]

Spirits producers in particular, have highlighted their 'donations' of pure alcohol for use in hand sanitizer products as well as their partnering with local manufacturers in the spirit of *"...help[ing] curb the spread of the coronavirus COVID-19"*.[171] Companies that initiate philanthropy of this nature may benefit from a public reputation boost, enhanced relationships with key decision makers, and ultimately enjoy disproportionate influence on the policy agenda.[172] Investigative journalism has revealed, for example, that public relations companies have been advising industry clients to *"...seed the press with 'positive news ... of companies doing something significant, generous and non-self-serving' "*.[168]

Removal and erosion of established regulation

In addition to gaining 'essential' service status for their products, alcohol industry representatives have lobbied extensively for the removal or easing of established regulatory restrictions on days and hours of trade[173] and numbers of licensed outlets[174]. Contactless home delivery, including third-party deliveries without age-controls in place[88,175,176], and support for e-commerce[154,177] are also being demanded. Additionally, the industry has



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exerted pressure on governments to place a moratorium on new laws that may affect its recovery or future viability such as planned duty increases, and minimization of regulatory burden.[178–180]

Where successful, major regulatory changes or concessions will be very difficult for future governments to reverse and are highly likely to extend well beyond the pandemic recovery period. Governments may be focused on rebuilding economies for years to come and therefore reluctant to create uncertainty for business. As time passes, new regulations will become increasingly embedded, expectations of continuance will be raised and commercial interests will claim reliance on the new order. Indeed, as exemplified in various media statements, current pressures being brought to bear on established regulation by vested interests are no doubt aimed at long-term outcomes favourable to industry objectives:

"... the alcohol industry has seen a decades-long wish list on easing sales restrictions fulfilled." [181]

"The Wine and Spirits Trade Association (WSTA) is lobbying for all UK governments to 'suspend the introduction of any new legislation' that comes with a cost to the drinks sector 'until we are well clear of the current crisis'." [168]

"The Adam Smith Institute, which works 'to promote free-market, neoliberal ideas', is already on the case, writing to supporters to solicit ideas. 'We want to hear from you of every tax cut that can lift a burden, every regulatory change that can lighten the load on businesses... every bureaucratic impediment that... might be suspended or permanently extinguished.' These ideas will constitute, it says, a 'blueprint for the new Britain that must emerge'." [168]



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Taxation reduction and suspension of scheduled adjustments

There is also evidence that various alcohol industry bodies have lobbied governments to reduce alcohol taxes and charges during the pandemic period and beyond. The common line of argument appears to be that in doing so, governments will stimulate recovery by pandemic-affected businesses and reduce unemployment. It is notable that while some regulatory controls in the alcohol industry's sights have arisen directly from the pandemic (e.g. temporary closure of pubs and restaurants), alcohol taxation is a long standing bugbear of the industry. The alcohol industry world-wide has a long history of aggressively lobbying against alcohol tax increases as a public health strategy while calling for lower taxes on its products.[149] There is little doubt that many alcohol companies view the current circumstances as an opportunity to press arguments in favor of achieving their objectives in relation to alcohol taxation.

In Australia for instance, industry representatives have demanded government set aside routine, scheduled increases in alcohol taxation rates.[178,179,182] Similar demands have been made in UK and in Canada.[183,184] In a letter to five European presidents (Eurogroup, European Central bank, European Commission, European Council, European Parliament), The Brewers of Europe (TBE) urged support for the on-trade hospitality sector by *"targeted reductions in VAT and excise over the medium term"*.[155] Although the letter did not elaborate on how a reduction in alcohol tax (presumably including beer), would support local business, boost recovery and job creation, it is reasonable to assume that the TBE foresees that reducing tax will increase their product consumption and sales. Paradoxically, when governments' have sought to address excess consumption via taxation change in the past, a common alcohol industry counter argument has been that taxation change is an ineffective and 'blunt instrument' for reducing alcohol consumption and sales.[185,186]

It is worth noting, however, that the related strategy of Minimum Unit Pricing – or just plain 'minimum pricing' – is not always opposed by industry groups. In Canada, all provinces and territories have some kind of minimum or 'floor price' on alcohol which is actually supported by major alcohol producers as it can positively affect profitability.[187]

In summary, across the globe, alcohol industry lobbyists have worked energetically during the COVID-19 crisis to shape public debate around alcohol's role in society, promote wholesale deregulation of its market and, ultimately, influence policy. A signature success, which may leave a lasting legacy, is ensuring that in most countries the sale and production of alcohol was deemed as an 'essential' service alongside the provision of food, fuel and pharmaceuticals. These lobbying efforts have sought to undo every element of effective alcohol policy known to reduce the health and social harms from alcohol e.g. by seeking to reduce taxes, increase convenience of access and remove restrictions on marketing. Given alcohol's status as a popular recreational drug, its designation as 'essential' and industry leverage, attempts to undo or re-set regulatory and policy changes that were at first framed as temporary measures, will doubtless present a challenge once the pandemic is passed. Industry actors have often used false and sometimes contradictory arguments to justify their desired deregulatory policies e.g. promoting the fiction that healthcare services would be swamped by cases of alcohol withdrawal if there was alcohol supply was severely curtailed or banned.

Later we will discuss how it is possible to have public health policies during a pandemic which would be effective in reducing the burden on healthcare services while also having a neutral to positive effect on the commercial sector e.g., through introduction of minimum unit pricing.



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4 Recommendations

This report was written about six months into the pandemic and not surprisingly, many aspects of the complex and multifaceted relationship between alcohol and COVID-19 remain in flux. Some of the long-term and even current effects of each upon the other will not be understood for some time and possibly never fully elucidated – but they will no doubt be substantial. Much more medical, epidemiological, psychological, and social research will be necessary to appreciate the true depth and breadth of their interwoven impacts on the health, wellbeing and safety of individuals and societies across the world. One key observation to draw from the pandemic is that it has pushed discussion of the public's health in terms of prevention, infections, medical treatment, and deaths to centre stage. As our understanding of the drivers behind the pandemic have improved, alcohol, with its own undoubtable history of public health concern, has also emerged as a key actor. Although the precise mechanisms are yet to be determined, interactions between the consumption and/or sale of alcohol and COVID-19 clearly represent a major public health challenge. Alcohol has been a key amplifier of the pandemic with major social and economic implications.

COVID-19 is obviously a major risk to health and, as this report has shown, this may be exacerbated by alcohol exposure through a range of physiological actions including alcohol's effect on the immune system and

its link to other risk factors such as diabetes, heart, lung, liver and digestive disease. Drinking has also played a central role in the transmission of COVID-19 between individuals and across populations both through poor decision-making while drinking and exposure to the virus in public drinking settings such as restaurants, bars, clubs, sporting events, and other gatherings.

Government responses to the virus such as 'Shelter in Place' orders and 'lockdown' restrictions, appear to have affected locations and patterns of drinking by both men and women and in some cases increased the risk of problems for which alcohol already has a major role such as domestic violence and mental health problems. Supply chain blockages and delays may have also reduced availability of, or access to, medications including birth control, particularly for women in developing countries. This has potential to increase unplanned pregnancies, fetal alcohol exposure and negative pregnancy outcomes (see *Alcohol, pregnancy and infant health – a shared responsibility*, Alcohol and Society 2020[188]).

Drinking among older people during the pandemic is of particular concern on at least three fronts. First, there is the potential for negative physiological effects of heavy alcohol use (and possibly also lower level use) on organ and immune system functioning that increase both the likelihood of infection and severity of COVID-19 disease among this already at-risk group. Second, this age group has a higher prevalence of co-morbidities, many of which are related to alcohol use, and this enhances vulnerability to severe outcomes (see *Alcohol and older people*, Alcohol and Society 2019[189]). And third, alcohol use creates an excess contribution that increases the burden placed on medical care systems by COVID-19 and ill-equipped or un-prepared aged care facilities (see *Alcohol and older people*, Alcohol and Society 2019[189]).

Another key consideration for all age groups is the burden that alcohol places on healthcare resources. Even under 'normal' circumstances, alcohol's contribution to the workloads of front-line health responders (e.g. ambulance services, emergency departments) and the associated financial costs to individuals and societies is substantial in many countries.[114,124,190–194] It is foreseeable, that in countries where governments intentionally or unintentionally expand access to alcohol during a pandemic, the capacity of health services to manage the immense challenges they face in treating large numbers of patients while minimizing workforce infection will be placed at further risk.

4.1 Recommendations for governments

Government responses to COVID-19 have led to changes in alcohol policy and regulation which have, in some respects, increased alcohol availability. It is a concern that these changes may continue to operate post-pandemic. There is ample evidence that in addition to continuance of government concessions made specifically to tide-over businesses during the pandemic, longer-term goals of commercial vested interests and their lobbyists include weakening of regulatory processes and reduced taxation. In many countries, vested interests have moved quickly to shape policy and public perceptions in ways that benefit their objectives and often with little or no opportunity for public health, enforcement or non-government social service sectors to respond. Key to this development has been the designation of the sale of alcohol as an 'essential service' or alcoholic beverages as 'essential products' by governments in many countries. Interestingly, this has especially been the case in many high and middle income countries.

Our first line recommendations for government in relation to the COVID-19 pandemic, as well as any future pandemics or epidemics, therefore include the following aimed at ensuring that alcohol's burden on public health and safety does not escalate in the medium to long-term:



As our understanding of the drivers behind the pandemic have improved, alcohol, with its own undoubtable history of public health concern, has also emerged as a key actor.



Collectively, moves to expand availability and ease of access put upward pressure on population consumption of alcohol and related harms.

- Governments should sustain and strengthen established (i.e. pre-pandemic) alcohol regulation including key controls on physical availability (e.g. conditions of sale including limited take-away sales and home deliveries, trading hours, number of licensed outlets, enforcement of age-based sale/consumption regulations) and economic availability (e.g. retail price relative to disposable income, scheduled tax adjustments, minimum sale prices). There is a strong existing evidence base for what constitutes effective policies to reduce alcohol consumption, hazardous patterns of drinking and alcohol-related harms.[e.g.61,195–197] Strengthening alcohol policies wherever possible, can lead to reduced alcohol consumption and related harm in any population. During a pandemic, such policies would lead to reduced pressure on healthcare services.
- Where concessions to industry have already occurred (e.g. on sale, supply, taxation or pricing) or are deemed necessary due to economic concerns, governments should not delay re-establishing pre-pandemic policy and regulatory standards fundamental to protecting public health and safety in the recovery phase.
- Governments should consider the introduction of minimum unit pricing (MUP) for the retail sale of alcohol (or increasing these where already implemented) in combination with increased excise taxation. This combination of policies can reduce alcohol consumption (particularly among the most vulnerable in society) and increase government revenues, while likely having a neutral to positive effect on the commercial sector.
- Governments and elected representatives should seek out and invite a range of views from diverse sectors regarding any proposed or intended change to alcohol policy. Consultation and decision making should be transparent, discoverable and available for full public scrutiny. All political donations, government engagements with vested interests, lobbying activities and lobbyists, should be listed on the public record.

In addition, where 'hot spots' or rapidly escalating cases occur, we recommend governments move quickly to implement a suit of temporary alcohol-related restrictions aimed at reducing transmission and reducing alcohol's direct and indirect contribution to the total burden on health care services:

- suspend drinking at high-risk on-trade outlet settings such as bars, nightclubs and restaurants;
- suspend alcohol service at sports arenas and events;
- suspend alcohol consumption in public places such as parks and beaches;
- impose daily limits on retail off-trade purchases/sales and home delivery, if allowed at all;
- make clinical and treatment provisions for people experiencing all types of alcohol-related problems, including withdrawal; and,
- increase access to mental health services, including online services.

4.2 Recommendations for individuals

Studies of the physiological impacts of alcohol on immune system functioning and on a range of organs, suggest that heavy alcohol use (and possibly lower levels of use), probably has an undesirable impact on the overall likelihood of viral infection, severity, recovery and long-term consequences. Although more evidence is needed, adhering to low-risk drinking guidelines (if alcohol is consumed at all) is strongly recommended.

We recommend that low level drinkers who are also not considered to be at high-risk from COVID-19 (see below) should closely observe their country's national drinking guidelines (or WHO advice where guidelines are unavailable[198]) for maintaining a low risk

of alcohol-related harm. Such guidelines often contain the following advice:

- Drinkers avoid drinking beyond low risk levels at all times, and avoid binge drinking in particular (i.e., drinking to the point of impairment);
- Drinkers who suspect they may have a drinking problem or alcohol dependence seek medical advice and assistance; and,
- At all times, it is safest to abstain from any alcohol consumption during pregnancy and breastfeeding.

The need to adopt a high level of caution is especially true for people at higher risk of severe infection due to older age or pre-existing health conditions, as they are more likely to develop severe symptoms. Therefore, alcohol exposure should be minimized or completely avoided by those who:

- are aged 65 years and older;
- have a history of tobacco use;
- are considered obese, hypertensive or diabetic;
- have cardiovascular disease, respiratory disease, cerebrovascular disease or cancer;
- have liver disease, especially cirrhosis.

Non-drinkers should not initiate alcohol consumption, especially on the basis of COVID-19 infection concerns – it is very unlikely that drinking will confer any net positive benefit with regard to COVID-19 disease.

Last, at all times, but during public health emergencies in particular, drinkers may consider further reducing their alcohol use as this will decrease their risk of experiencing alcohol-related health conditions, such as cancer, injury and liver disease.[199,200]

Conclusion

COVID-19 has affected alcohol consumption, and alcohol consumption has played a crucial role in the transmission and propagation of the pandemic. In short, alcohol and COVID-19 has been, and continues to be, a lethal interaction. Alcohol policies that have been adopted – or not adopted – during the pandemic account for some of this adverse impact on both alcohol-related outcomes and on the pandemic itself. It is also important to consider the post-pandemic health and safety impacts of alcohol policies developed during the pandemic. As discussed throughout this report, any 'temporary policy changes' which have increased access to alcohol or lowered prices should be reversed; a failure to do so would ensure a lasting and negative legacy of the pandemic on public health.

Collectively, moves to expand availability and ease of access put upward pressure on population consumption of alcohol and related harms. In support of this we point to the costs of alcohol that often exceed those of tax revenues and advise decision makers to consider impacts of alcohol consumption across full economic and social spectrums (including harms from others)[69,194,201–209] rather than promote the interests of selected production, distribution, and retail sectors. We point to the ethical implication that among all psychoactive substances, alcohol contributes most to 'second-hand effects' – those harms and costs accrued by persons or entities other than the drinker him or herself.

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