

Snowdon, Christopher

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IEA Discussion Paper No.109

LOCKDOWN LESSONS IN HEALTH ECONOMICS

The case of alcohol

Christopher Snowdon
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Contents

About the author	4
Summary	6
Introduction	8
The single distribution theory	9
The UK's lockdown experiment	11
Alcohol consumption and mortality	14
Another 'paradox'?	19
Conclusion	23
References	25

Christopher Snowdon is the Head of Lifestyle Economics at the Institute of Economic Affairs. He is a regular contributor to *The Spectator*, *The Telegraph* and *The Critic* and often appears on TV and radio discussing lifestyle regulation, prohibition and policy-based evidence. He is the editor of the Nanny State Index and the author of six books: *Polemics* (2020), *Killjoys* (2017), *Selfishness, Greed and Capitalism* (2015), *The Art of Suppression* (2011), *The Spirit Level Delusion* (2010) and *Velvet Glove, Iron Fist* (2009). He has written more than twenty papers for the Institute of Economic Affairs including 'Drinking, Fast and Slow', 'A Safer Bet', 'Cheap as Chips', 'Sock Puppets' and 'Death and Taxes'.

Summary

- According to a popular theory in public health, limiting the availability, affordability and advertising of alcohol reduces per capita consumption of alcohol which, in turn, leads to a decline in alcohol-related deaths. The theory assumes that a decline in average consumption will lead to a reduction in heavy drinking. In the words of two proponents of the theory: 'to help the minority the "normal" majority must change'.
- Empirical evidence for this theory is mixed and conflicting. Nevertheless, it is used to justify government intervention in the alcohol market through policies such as advertising bans, licensing restrictions and higher taxes aimed at lowering per capita consumption.
- The first year of the COVID-19 pandemic in the UK provided a 'natural experiment' in which the impact of dramatic changes in the availability and marketing of alcohol can be examined. During two periods of lockdown lasting a total of five months, the number of alcohol outlets fell by approximately two-thirds and expenditure on alcohol advertising fell by approximately half. There was little change in the price of alcohol although it became slightly less affordable due to a fall in incomes.
- Per capita alcohol consumption fell by six per cent during the first lockdown and by four per cent in 2020 overall. There was, however, significant variance in the distribution, with heavy drinkers tending to drink more and moderate drinkers tending to drink the same or less.
- Despite the decline in per capita consumption, the UK saw a sharp rise in the number of alcohol-specific deaths of 18.7 per cent.
- It is plausible that restrictions on the availability of alcohol contributed to the decline in per capita consumption. Whatever the cause, the fall in consumption was not accompanied by a decline in either heavy drinking or in alcohol-related mortality, contrary to the public health model.

- The UK's natural experiment of 2020 provides further evidence that harmful drinking is not driven primarily, if at all, by 'commercial determinants' but by personal circumstances, hardship and stress. Policies based on the whole population approach should be abandoned, not just because they place costs on all drinkers but because they are a distraction from constructive policies that could help the minority who are at greatest risk.

Introduction

The draconian lockdowns introduced around the world from March 2020 to reduce transmission of SARS-CoV-2 constituted a series of extreme natural experiments, the results of which will be studied by social scientists for years. Large parts of the economy were shutdown overnight. Unprecedented restrictions on movement and social interaction led to an increase in self-reported anxiety and a decline in self-reported happiness (ONS 2021). There was a decline in greenhouse gas emissions and a fall in road accidents, but a rise in domestic violence, drug overdoses and - more surprisingly - pet thefts. There was a sharp rise in video conferencing, internet shopping and working from home, all of which remained above pre-pandemic levels after the restrictions were lifted.

This paper looks at a natural experiment that took place in the UK's alcohol market in 2020. As in many other countries, the number of outlets selling alcohol was greatly reduced by lockdown regulations. The hospitality industry, which sold 28 per cent of all alcohol in Britain in 2019, was closed for nearly five months. With bars, pubs and nightclubs closed, the alcohol industry pulled much of its advertising.

According to contemporary public health theory, as outlined below, these dramatic reductions in the availability and marketing of alcohol should have led to a marked decline in per capita consumption which, in turn, should have led to a decline in alcohol-related deaths. This paper examines how well that theory stood up in practice in the first year of the pandemic.

The single distribution theory

Starting in the 1960s, a view began to take hold in the alcohol research community that the amount of heavy drinking and alcohol-related harm¹ in a society were directly linked to per capita alcohol consumption (Room and Livingston 2017). It was argued that this was not because heavy drinkers consumed a large quantity of alcohol (thereby raising the mean), but because the entire distribution of consumption was *determined* by the mean. According to Skog (1985: 97), ‘the population will tend to behave as a collective’ and will ‘move in concert up and down the consumption scale, thereby creating a close connection between the general level of consumption in the population and the prevalence of heavy use.’

This is known as the single distribution theory and it was given support by the influential theories of the British epidemiologist Geoffrey Rose in the early 1990s. Rose argued that many health problems associated with heavy drinkers (‘deviants’ in his terminology) could be tackled by reducing consumption by the rest of society. This, he said, would be more effective than policies aimed at those who are at high risk. As Rose and Day (1990: 1,034) put it, ‘to help the minority the “normal” majority must change’.

Despite criticism from within the public health research community (e.g. Roche 1997, Uhl 2015, Raninen and Livingston 2020), this ‘whole population approach’ has become the orthodoxy in public health. It has been explicitly endorsed by the World Health Organisation, the Scottish government, virtually all anti-alcohol pressure groups and most public health organisations. The National Institute of Clinical Excellence (2010: 28), for example, says:

1 Alcohol-related harm includes death, injury and disease suffered by the user but also violence, anti-social behaviour, drink-driving and other crime associated with excessive alcohol use.

...the number of people who drink a heavy or excessive amount in a given population is related to how much the whole population drinks on average. Thus, reducing the average drinking level, via population interventions, is likely to reduce the number of people with severe problems due to alcohol.

Adhering to the belief that reducing per capita alcohol consumption is necessary and sufficient to reduce alcohol-related harm, proponents of the whole population approach endorse population-wide, supply-side interventions in the market - targeting 'the Three A's': affordability, availability and advertising. Policies include alcohol duty rises, minimum pricing, tougher licensing laws and advertising bans.

The World Health Organisation calls these policies the 'best buys' and encourages member states to introduce them. However, while the law of demand suggests that higher prices will lead to less consumption overall, taxes and minimum pricing impose costs on all drinkers and will not necessarily lead to less harm. Restricting advertising and availability disrupts the market but the evidence that it reduces consumption, let alone harm, is weak (Wilcox et al. 2015; Bryden et al. 2012).

Critics of the single distribution theory argue that it puts the cart before the horse and that the relationship that often exists between per capita alcohol consumption and alcohol-related mortality can more plausibly be explained by the third variable of heavy drinkers consuming so much alcohol that their consumption has a large effect on the mean. If there are more heavy dependent drinkers, per capita consumption will tend to rise. If there are fewer, it will tend to fall. This is supported by empirical evidence. As Poikolainen (2017: 80) found in his study of 29 OECD countries:

The number of alcohol dependents and abstainers seemingly determine total alcohol consumption.

If rates of alcohol-related mortality are driven by the number of heavy drinkers (and by how much they consume) and not by per capita consumption *per se*, the link between overall consumption and mortality can be broken by treatment, education and rehabilitation, but it will be not affected by moderate drinkers reducing their consumption. Pulling economic levers, such as tax rises, to reduce the population's overall consumption of alcohol will therefore not be effective in reducing harm unless heavy drinkers respond to them.

The UK's lockdown experiment

As shown in a previous IEA Discussion Paper (Duffy and Snowdon 2014), there are many examples of real-world evidence challenging the single distribution theory. Per capita consumption sometimes rises while alcohol-related harms fall, and vice versa (Hallgren et al. 2012, Livingston et al. 2010). In Norway and Ireland, alcohol consumption rose between 1980 and 2000, but rates of liver cirrhosis fell. In the UK, an 18 per cent decline in per capita alcohol consumption between 2004 and 2016 was not accompanied by a decline in alcohol-related deaths or hospitalisations which, as Whittaker et al. (2020: 1,987) note, is 'striking, given that many argue that population-level consumption and harm trends typically move in the same direction'.

Evidence from the real world has also contradicted the whole population approach and the policies derived from it. For example, relaxing the licensing laws in Scotland in the 1970s did not lead to greater alcohol consumption or more alcohol-related harm (Duffy and Plant 1986), nor did extending pub opening times in England and Wales in 2005 (Snowdon 2015). Alcohol taxes were cut heavily in Denmark in the 1990s and early 2000s and alcohol consumption fell. In Sweden, extending the opening hours of off-licences led to a rise in alcohol purchases but no rise in alcohol-related harm (Avdic and von Hinke 2021).

Sudden and dramatic changes in policy allow theories to be tested on a grand scale. The UK's COVID-19 lockdowns were not aimed at reducing alcohol consumption, of course, but they nevertheless heavily disrupted the alcohol market. Of the three factors that are assumed to be the economic drivers of alcohol consumption in the public health model, two of them (availability and advertising) were greatly curtailed from March 2020.

Availability

The number of places in which alcohol could be bought collapsed on 20 March when pubs, clubs, bars and restaurants were closed by law.² Hotels were closed for leisure and tourism, although some remained open for limited business purposes. Nightclubs were closed from 20 March 2020 until 19 July 2021 in England and until January 2022 in Scotland and Wales. At a stroke, most premises with a commercial alcohol licence were shut.

The government has not published statistics on the number of licensed premises for several years but at the last count there were 133,000 licences for the on-sale of alcohol in England and Wales (Home Office 2018). The vast majority of these were forced to close from 20 March until 4 July and then again between 5 November and 2 December. During the lockdowns, off-licences - including home delivery companies and most supermarkets - were almost the only places from which alcohol could be bought. There were 53,400 of these in 2018 (ibid.). The number of places selling alcohol therefore fell by approximately two-thirds. Its availability, as defined in modern public health, was greatly reduced.

Advertising

The UK advertising market shrank by seven per cent in 2020. TV and radio advertising spend dropped by more than ten per cent. Advertising in national newspapers fell by 24 per cent and advertising in magazines fell by 29 per cent.³ Digital advertising was the only part of the industry to see growth, reflecting a sharp increase in e-commerce and heavier internet use during lockdown, although the rate of growth (five per cent) was much lower than in 2019 (15 per cent).⁴

The alcohol industry uses TV and out-of-home advertising more than most. The spirits industry, in particular, is reliant on the sale of premium products in bars and clubs, both of which were shut for months in 2020. Consequently, there was a dramatic decline of 48 per cent in advertising spend on beer and spirits in the UK in 2020 (Zenith 2021: 13). Figures for wine and cider are not available, but neither of them are advertised as widely as beer and spirits.

2 Some pubs sold takeaway alcohol towards the end of the first lockdown but this was banned during the November lockdown.

3 <https://pressgazette.co.uk/uk-advertising-market-spend-uk-20/>

4 <https://www.iabuk.com/research/digital-ad-market-proves-resilient-5-growth-2020>

Affordability

The pandemic did not significantly affect the price of alcohol. The *average* price of a unit of alcohol fell because the more expensive drinks sold in hospitality venues were unavailable, but in the off-trade prices did not change appreciably. Routine inflation statistics published by the Office for National Statistics do not suggest that the price of alcohol and tobacco (the two categories are grouped together) changed significantly in 2020. According to Richardson, E. and Giles, L. (2021: 6) the affordability of alcohol in the UK 'decreased slightly in 2020 due to a real-terms decrease in disposable income.'

Alcohol consumption and mortality

Consumption

With alcohol much less available, much less advertised and slightly less affordable, modern public health theory would predict a fall in alcohol consumption and related harm. Indeed, consumption did fall - by a little.

There has been some confusion about alcohol sales trends due to early media reports about panic buying and a reliance on HMRC's alcohol tax revenues.⁵ The OECD (2021: 2) has claimed, based on 'preliminary government tax receipt data', that 'alcohol sales increased by 3% to 5% in Germany, the United Kingdom and the United States in 2020 compared to 2019.' This does not follow from the evidence, at least as far as the UK is concerned. HMRC reported a slight increase in alcohol duty revenue in the first year of the pandemic, from £11.9 billion in 2019/20 to £12.1 billion in 2020/21. This is a 1.7 per cent increase - not an increase of between three and five per cent - and it does not imply that the amount of alcohol consumed rose by 1.7 per cent (HMRC 2021: 41).

Firstly, it does not account for inflation or population growth. Secondly, it does not account for the different tax rates of different drinks. A unit of alcohol in gin, for example, is taxed at a higher rate than a unit in beer. This is important because the market shifted from beer and cider to more heavily taxed wine and spirits after the hospitality industry closed in March 2020. Data from Public Health England (2021: 3) shows an 8.9 per cent increase in wine sales, a 7.3 per cent rise in spirits sales, a 14 per cent decline in beer sales and a 16.7 per cent decline in cider sales between

5 in addition, a study based on online survey data incorrectly claimed that alcohol consumption rose during the first lockdown (Kilian et al. 2021).

2019/20 and 2020/21. Overall, despite a £200 million increase in alcohol duty revenue, this amounted to a 1.2 per cent decline in overall alcohol consumption (ibid.).

After the surge in off-trade alcohol sales in March 2020 caused by stockpiling and panic buying,⁶ the rise in off-trade sales could not fully compensate for the collapse of the on-trade. Based on sales figures, Richardson and Giles (2021: 5) estimate that per capita consumption in England and Wales fell by four per cent between 2019 and 2020 (from 9.2 litres to 8.8 litres) and by five per cent in Scotland (from 9.9 litres to 9.4 litres).

During lockdown specifically, evidence analysed by Hardie et al. (2022: 7) shows a marked decline in alcohol consumption, from 16.5 units a week in England pre-lockdown to 14.3 units during the first lockdown (a fall of 13 per cent). A report commissioned by Public Health Scotland estimates that the COVID-19 restrictions were associated with a six per cent reduction in alcohol sales in both England & Wales and Scotland between 15 March and 11 July 2020 (Richardson et al. 2021: 25).

So while there is some question about the exact scale of the decline in consumption, there is no doubt that consumption fell in the UK in the first year of the pandemic, particularly during the first lockdown between March and July 2020.⁷

Drinking patterns

Self-reported figures shine some light on the distribution of alcohol consumption. A YouGov survey conducted in May 2020 found that 17 per cent of British adults drank less in lockdown, including three per cent who stopped altogether, while 15 per cent drank more (Public Health England 2021b). On the other hand, the National Diet and Nutrition Survey found that a greater number of people drank more than drank less during what it called the 'COVID-19 period'. Between February and August 2020, 22 per cent of people aged 16 or over drank more than usual and 13 per cent drank less (ibid.).

6 Public Health Scotland (2021: 4) estimates that off-trade sales rose by 42 per cent in Scotland and by 47 per cent in England and Wales in the week before lockdown.

7 Note that sales and consumption are very closely aligned when it comes to alcohol. Not all alcohol sold is consumed but the amount of 'spillage' is relatively small and is assumed to be constant from year to year.

A range of surveys has produced conflicting reports. Results collated by Public Health England (2021: 42) found that between 14 and 26 per cent of people said they were drinking more and between 11 and 37 per cent said they were drinking less. In every survey, however, the largest proportion of drinkers said their alcohol intake remained the same. Whichever set of statistics is correct, it should be clear that there was no general pattern towards more or less consumption. The whole of society did not move in lockstep.

Jackson et al. (2021: 1,239) found a large increase in the number of heavy drinkers during lockdown, but an even bigger increase in the number of high-risk drinkers who attempted to reduce their alcohol intake. Overall, however, there seems to have been an increase in heavy drinking. Niedzwiedz et al. (2021) found an increase in binge-drinking during lockdown among people aged 25 or older. Public Health England (2021: 75) found that 'the heaviest drinking respondents appear to be reporting higher volumes and frequencies of alcohol consumption' and 'heavy buyers of alcohol before the pandemic are mostly responsible for the increases in off-trade purchasing'. This is consistent with evidence from Europe where most of the people who changed their drinking behaviour during the pandemic drank less, but the consumption of heavy drinkers 'solidified or intensified' (Kilian 2022).

In summary, per capita alcohol consumption fell in the UK but most people did not change the amount they drank and those who did went in opposite directions, with heavy drinkers tending to drink more. There was no single distribution.

Alcohol Related Harm

Was the decline in per capita alcohol consumption accompanied by a decline in alcohol-related harm, as the whole population theory dictates? Not at all.

Hospitalisation data has not yet been published for England and it is likely to be confounded by the broader collapse in hospital admissions for non-Covid patients during the pandemic.

But there is clear evidence of a dramatic increase in alcohol-specific mortality in the UK with the death rate rising by 18.7 per cent in 2020 (ONS 2021b), as Figure 1 shows.⁸

Figure 1: Alcohol-specific mortality rates in the UK (2001-2020)

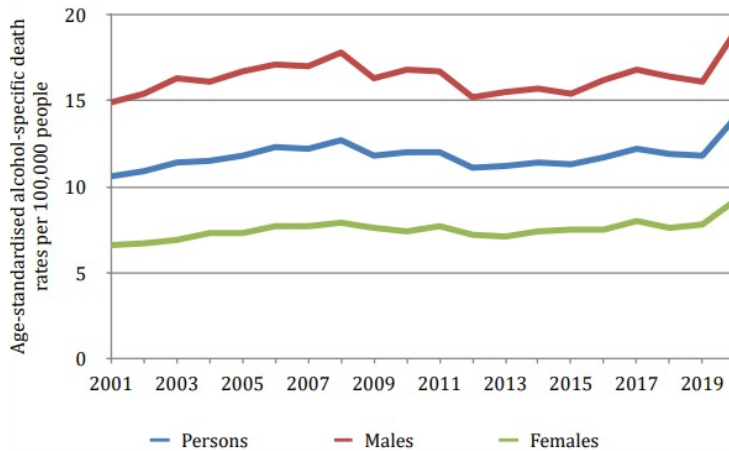
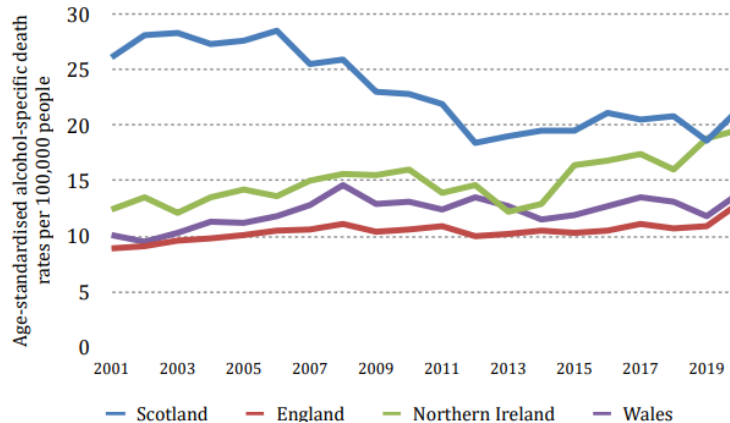


Figure 2 shows that alcohol-specific mortality rose in all four nations of the UK. It should be noted that Scotland has had minimum alcohol pricing (at 50p per unit) since 2018 and Wales introduced the same policy in April 2020. This almost exclusively affects prices in the off-trade but, despite the on-trade being closed for much of 2020, there is little evidence that it made a difference during the pandemic. Scotland and Wales saw a rise in alcohol-specific deaths of 17 per cent and 19 per cent, respectively. England and Northern Ireland, which did not have minimum pricing, saw rises of 20 per cent and 4 per cent respectively (ONS 2021b).

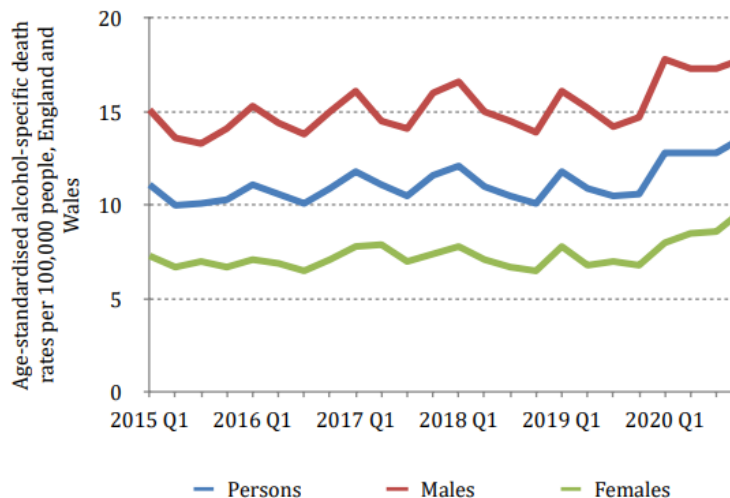
⁸ Note that 'alcohol-specific' deaths are wholly due to alcohol use, as distinct from the broader category of 'alcohol-related' deaths which include diseases in which alcohol is one risk factor, such as cancer.

Figure 2: Alcohol-specific mortality rates in England, Scotland, Wales and Northern Ireland (2001-2020)



The quarterly data displayed in Figure 3 shows the bulk of the rise in alcohol-specific mortality took place in the first quarter of 2020. This is interesting because no part of the UK was in lockdown until the last week of March. Assuming the rise was in some way connected to the pandemic, this suggests anxiety and stress in the early stages led to heavier consumption among some drinkers (ONS 2021b).

Figure 3: Alcohol-specific mortality rates in the UK by quarter (2015-2020)



Another 'paradox'?

The reader may not be surprised to hear that deaths caused by excessive alcohol consumption rose in the first year of the COVID-19 pandemic. It is easy to imagine anxiety about the disease combined with the tedium of lockdowns driving some people to drink. It should also not be surprising that some people chose to reduce their alcohol consumption or that people who only drank socially stopped drinking altogether. There is, therefore, no logical inconsistency between overall alcohol consumption falling while alcohol-related deaths rose.

Perhaps the only surprising aspect is that the deaths occurred so quickly. Diseases like liver cirrhosis typically require years of heavy drinking before they develop, so shouldn't there be more of a time lag? Not necessarily. An evidence review by Holmes et al. (2012) found that the time between a change in drinking behaviour and a change in health outcomes can be remarkably short. Even with a disease such as liver cirrhosis, which takes years to develop, 'much of the impact on cirrhosis mortality rates occurs in the first year following a change in consumption' (ibid.: 8). They estimated that once drinking behaviour changes at the population level, 60 per cent of the impact on cirrhosis rates is seen within twelve months (ibid.: 10).

The reason for this is that those who have liver cirrhosis can often prevent their death by ceasing, or dramatically reducing, their drinking, while those who are drinking at dangerous levels can hasten their death by upping their intake. The majority (78 per cent) of alcohol-specific deaths recorded in the UK in 2020 involved alcoholic liver disease (6,985 out of 8,974 deaths, up from 5,840 out of 7,565 deaths in 2019). Deaths from alcohol poisoning, which have no time lag, rose from 492 in 2019 to 552 (ONS 2021b).

It is very difficult to blame this on the 'commercial determinants of health' which dominate the modern public health literature. Consumers did not respond to changes in the availability and promotion of alcohol in a predictable or consistent way. Even in South Africa, which introduced total prohibition of alcohol as part of its lockdown, research shows that 'heavy episodic drinkers were prone to consuming more alcohol during restrictions, while moderate drinkers drank the same as usual, or less' (Theron et al. 2022: 12).

In the UK, the advertising and availability of alcohol fell dramatically in 2020 and was accompanied by a small but significant drop in alcohol consumption. Whilst this is consistent with the public health model, the extent to which the decline was *caused* by changes in advertising and availability is debatable. It is likely that the closure of the on-trade was a factor insofar it caused some social drinkers to reduce their consumption or stop drinking altogether, but the decline in alcohol advertising was largely a *response* to falling demand, especially in the on-trade, rather than its cause. The evidence that restricting alcohol advertising reduces alcohol consumption is weak (Siegfried et al. 2014) and even proponents of advertising restrictions generally frame them as long-term policies. However, it should be noted that the WHO (2019: 17) claims that restricting alcohol advertising will 'reduce the presence of alcohol cues that can induce reactivity and craving in alcohol-dependent persons'. This doesn't seem to have happened in 2020.

Regardless of what caused the drop in per capita alcohol consumption, it clearly did not lead to the declines in heavy drinking and alcohol-related mortality that the model predicts. On the contrary, there was an unprecedented rise in the number of deaths caused by excessive alcohol consumption.

Moreover, consumption patterns did not follow a single distribution. Roughly a fifth of drinkers drank less, a similar number drank more, and the majority did not change the amount they drank. The behaviour of the 'deviants' at the end of the distribution was not affected by the mean.

A study for Public Health Scotland hinted at an element of surprise when its authors found that although alcohol consumption in Scotland in 2020 was nine per cent lower than the 2017-19 average, the number of alcohol-specific deaths was nine per cent higher.

This finding gives further weight to the evidence from elsewhere that drinking at hazardous and harmful levels may have increased for some groups, despite consumption reducing at the population level. (Richardson et al. 2022: 54)

The word ‘despite’ should be read in the context of the Scottish government’s Alcohol Framework which explicitly refers to ‘the Three A’s’ and says:

We continue to take a whole population approach which aims to reduce alcohol consumption and the risk of alcohol-related harms across a population... (Scottish Government 2018: 9)

In a study of alcohol purchases in England and Wales during the 2020 pandemic, titled ‘The COVID-19 Alcohol Paradox’, Anderson et al. (2022:11) also expressed an element of surprise when they found an increase in heavy alcohol consumption and an increase in alcohol-related mortality despite no increase in per capita consumption.⁹

Here we see a new paradox in which British data suggest no increases in overall sales and purchase of alcohol following COVID-19 lockdowns, yet survey and mortality data suggesting otherwise is due to differential changes by population sub-groups. The top one fifth of purchasing households (by how much they normally purchased) increased their purchases 17 times more than the bottom one fifth of purchasing households.

Seeking to explain the ‘paradox’ of lower per capita consumption and higher mortality, the authors offer the following:

One explanation of these differences could be that, whereas overall levels of alcohol sales and consumption have not increased, the distribution of changes within the population during lockdown has varied. (ibid.: 2)

A varying distribution of consumption is what their study shows and it is consistent with plenty of other evidence, but it does not explain the ‘paradox’ so much as restate it. If some drinkers greatly increased their consumption while others reduced it, there is no single distribution. The ‘paradox’ only exists if one adheres to the theory that consumption at the tail of the

9 The authors compared alcohol purchases in 2020 to the 2015-19 average and found a non-significant decline of just under one per cent (-0.9%, 95%CI = -5.6 to 3.8).

distribution is driven by the mean and that there is fixed link between per capita consumption and alcohol-related mortality.

This theory can more accurately be described as a hypothesis since it has never been supported by strong evidence and there is much evidence to the contrary, of which the UK experience of 2020 is merely the latest. There are too many exceptions to the rule for them to be dismissed as paradoxes or outliers. It seems more likely that the 'rule' is wrong.

Conclusion

A more reasonable conclusion to draw, which was amply illustrated by the extraordinary natural experiment of 2020, is that harmful drinking is not driven primarily, if at all, by ‘commercial determinants’ but by personal circumstances, hardship and stress. From this we might conclude that tackling harmful drinking requires focusing on harmful drinkers rather than on the whole population. Not only would this be of greater benefit to those who are vulnerable, but it would benefit the majority of drinkers who do not drink at harmful levels and who incur the costs of taxes, regulations and price controls which are explicitly designed to ‘restrict commercial activity’ (WHO 2019: 5).

The British Liver Trust identified ‘[s]tress, loneliness and a lack of access to alcohol support services’ during the pandemic as the drivers of the rise in alcohol-specific deaths in 2020.¹⁰ Other experts have echoed concerns about the lack of face-to-face support and in-patient detox for people with alcohol problems during the pandemic.¹¹ Jackson et al. (2021: 1,239) found the number of heavy drinkers who sought to reduce their alcohol intake nearly doubled during lockdown, but the number accessing face-to-face support fell by three-quarters. This only serves to underline the point that helping the minority of problem drinkers is more effective than policies aimed at the whole population.

It is plausible that restrictions on the availability of alcohol contributed to the decline in per capita alcohol consumption in 2020. Whatever the cause, it is clear that the fall in consumption was not accompanied by a decline in alcohol-related mortality, just as the decline in consumption between

10 <https://www.gov.uk/government/news/alcoholic-liver-deaths-increased-by-21-during-year-of-the-pandemic>

11 <https://www.bbc.co.uk/news/health-59417105>

2004 and 2016 was not accompanied by a decline in alcohol-related mortality. The whole population hypothesis has been tested and once again been found wanting. It should now be abandoned, not just because the policies derived from it place an unwarranted burden on the majority of drinkers but because it is a distraction from constructive policies that could help those most at risk.

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The Institute of Economic Affairs
2 Lord North Street
London SW1P 3LB
Tel 020 7799 8900
email iea@iea.org.uk


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