Modelling the impact of changes in alcohol consumption during the COVID-19 pandemic on future alcohol-related harm in England

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Executive Summary

- The School of Health and Related Research (ScHARR) at the University of Sheffield were commissioned by NHS England & NHS Improvement to estimate the impacts of pandemic-related changes in alcohol consumption on alcohol-related health and mortality.

- The work was conducted using Alcohol Toolkit Study (ATS) data to estimate the changes in drinking in 2020 and 2021, and scenario modelling using the Sheffield Alcohol Policy Model (SAPM).

- ATS data shows that lighter drinkers decreased their consumption during the pandemic but heavy drinkers increased consumption. This polarisation is greatest among men and people in the highest socioeconomic groups while 25-34 year-olds who were drinking at risky levels before the pandemic have seen the biggest increase in alcohol consumption in 2020/21.

- We developed five alternative scenarios for how alcohol consumption may develop from 2022 onwards. One main scenario was chosen for illustrative purposes, which assumed that lower risk drinkers (those drinking within the current UK low risk guidelines) return to their pre-pandemic levels of drinking from 2022, whilst heavier drinkers remain at their pandemic levels for a further 5 years before gradually returning to pre-pandemic levels over the following 5 years.

- Four other scenarios were chosen to reflect a range of more or less pessimistic outcomes. These included a best-case scenario where all drinkers return to their 2019 levels of drinking in 2022, and a worst-case scenario where alcohol consumption increases in 2022 as a result of relaxation of COVID restrictions and the opening up of pubs, bars, restaurants and nightclubs.

- In our main scenario, we estimate that over the next 20 years, there will be an additional 207,597 alcohol-attributable hospital admissions and 7,153 alcohol-attributable deaths, costing the NHS an additional £1.1bn compared to if alcohol consumption had remained at 2019 levels.

- These impacts are not evenly distributed across the population, with heavier drinkers and those in the most deprived areas, who already suffer the highest rates of alcohol-attributable harm, expected to be disproportionately affected.

- In our best-case scenario, even if drinking behaviour returns to pre-pandemic levels in 2022, we estimate an additional 42,677 alcohol-attributable hospital admissions and 1,830 deaths over 20 years.

- In our worst-case scenario these figures rise to an additional 972,382 alcohol-attributable admissions and 25,192 deaths at a cost to the NHS of £5.2bn over 20 years.

- This analysis highlights that changes in alcohol consumption during the COVID pandemic are estimated to have a significant impact on alcohol-related harm in England for many years to come.

- Given that these impacts come at a time when there are significant pressures affecting the NHS as a result of the pandemic, the government should give due consideration to policies aimed at reducing alcohol consumption and the associated burden of harm.

Contents

Introduction

The COVID-19 pandemic has had an enormous impact on many aspects of people's lives – from the direct health impacts of the coronavirus itself to the wider behavioural and economic impacts of the pandemic response. In England, national 'lockdowns' were in place in March-June and November-December 2020 and January-March 2021 with a wide range of national and local restrictions in place at other times, including the closure of pubs, restaurants and nightclubs[1]. One consequence of these restrictions has been a major change in the ways in which people purchase alcoholic drinks and the settings and contexts in which they drink them.

Alcohol consumption is associated with a wide range of negative health effects and previous analyses using the Sheffield Alcohol Policy Model[*] have estimated that it was responsible for 10,700 deaths and 640,000 hospital admissions, at a cost to the NHS of £2.7bn in England in 2019[2]. The pandemic has placed unprecedented strain on healthcare services, but it is unclear to what extent changes in alcohol consumption may have contributed to this. Initial signs are concerning, with 2020 seeing deaths from causes which are wholly-attributable to alcohol (such as alcoholic liver disease) rise by 19.3% in England compared to 2019[3]. These figures may reflect changes in people's willingness or ability to access both healthcare and specialist alcohol treatments services during the pandemic as well as the direct impact of changes in alcohol consumption on health[4]. However, they do not capture either the effects of changes in alcohol consumption on health conditions which are partially related to alcohol (such as injuries and cardiovascular diseases) or the longer-term consequences for health. Epidemiological evidence suggests that changes in alcohol consumption can take many years to feed through into changes in risk, particularly for cancers[5], meaning that we may not see the full health effect of recent changes in drinking for well over a decade.

In November 2021, the Sheffield Alcohol Research Group was commissioned by NHS England to analyse evidence on changes in alcohol consumption during the COVID-19 pandemic and to estimate the impact of these changes on future health and health-related costs in England over the following 20 years. This report presents the findings of this work, using the Sheffield Alcohol Policy Model (v4.1) to model future health outcomes under a range of alternative scenarios about the persistence of recent changes in drinking.

Methods

Covid-19 and alcohol consumption trends

The combination of 'stay-at-home' orders, a ban on all socialising with other households and the closure of all pubs, restaurants and nightclubs during the first and subsequent lockdowns in 2020-21 is an unprecedented shock to the ways that we buy and consume alcohol. Unsurprisingly alcohol sales in the off-trade (shops) increased substantially, while sales fell in the on-trade (pubs, bars, restaurants and nightclubs)[6]. However, estimating the net effect of these changes on overall alcohol consumption presents several challenges. Our primary source of information on alcohol consumption in England is the Health Survey for England (HSE), but HSE data is not yet available for 2020 or 2021 and data collection for those years is likely to have been significantly affected by the pandemic. One alternative is to look at data published quarterly by Her Majesty's Revenue and Customs (HMRC) on the volumes of alcohol cleared for sale.

Analysis of this data, included in the appendix to this report, shows that overall alcohol sales are likely to have increased during 2020-21 but suggests that this increase may not be uniform across

[*] Note that these estimates are lower than similar figures from some other sources – we address these differences in the Discussion section of this report

the population as sales of some products have increased while others have fallen. We cannot, however, establish whether a fall in beer clearances and a rise in spirits clearances reflects a reduction in the overall purchasing of beer drinkers, offset by a rise in purchasing of spirits drinkers, or a shift from beer to spirits purchasing for individuals. Nor does it tell us anything about whether different groups in the population have changed their behaviour in different ways. Understanding these differences is critical to estimating the health impacts of changes in drinking, as the burden of alcohol-related harm is distributed unequally across society.

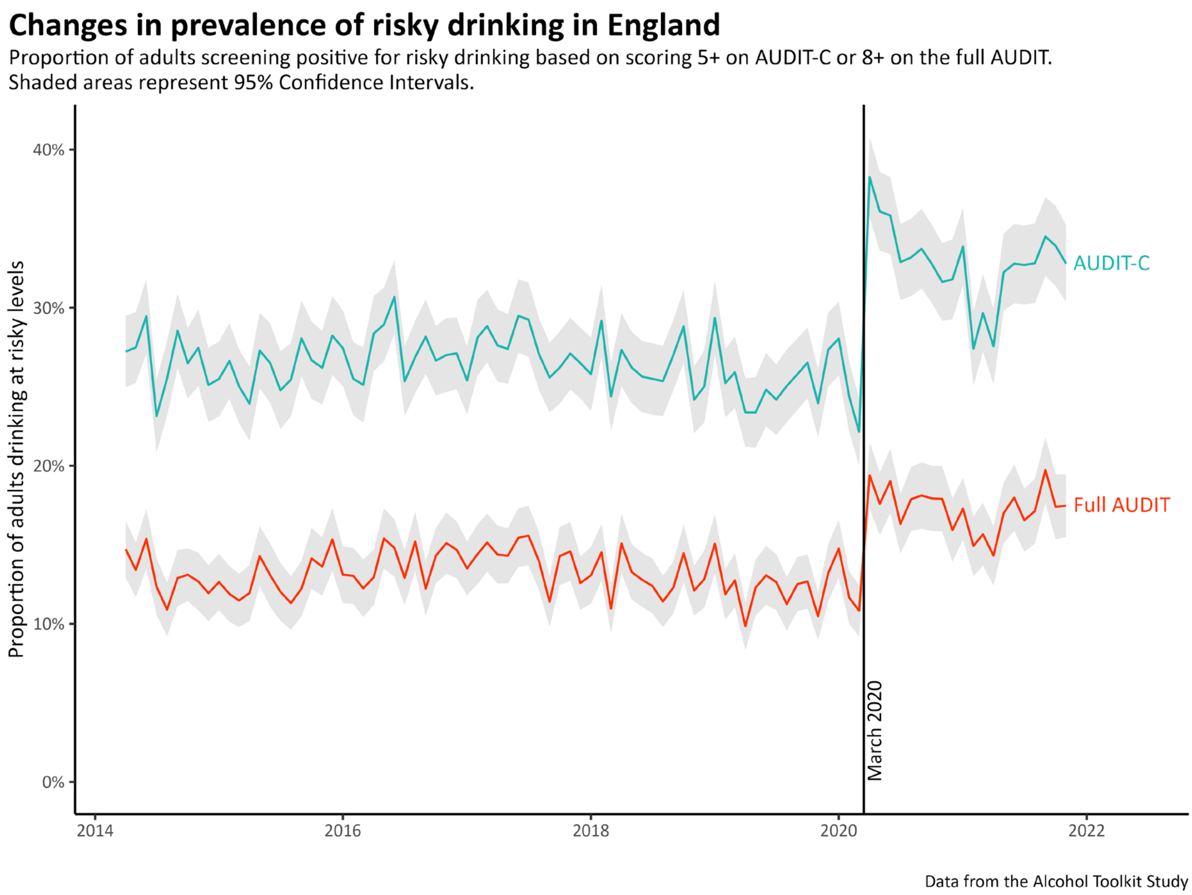
Individual-level data on alcohol consumption, however, is extremely challenging to collect. Ideally we would like consistent, longitudinal data on the alcohol consumption of individuals starting from before the pandemic and including changes to drinking in 2020-21, but no such data exists is available for England. There have been a number of surveys, particularly during the first lockdown, which asked respondents how their current drinking compared with pre-pandemic levels, but such questions are strongly subject to bias. Nevertheless, a consistent picture emerged from these surveys to suggest that alcohol consumption rose in heavier drinkers and fell in lower risk drinkers, at least during the early stages of the pandemic[6].

A more robust approach is to look at cross-sectional survey data which has been collected consistently and regularly both before and after the pandemic first hit in early 2020. One such study is the Alcohol Toolkit Study (ATS), a monthly survey of around 1,700 adults in England, designed to be representative of the general population, which has been running since 2014[7]. The main measure collected in the ATS is the Alcohol Use Disorders Identification Test (AUDIT)[8], a 10-item questionnaire which asks respondents about their alcohol consumption and their experiences of alcohol-related problems. The first three questions of the AUDIT relate to alcohol consumption only and are referred to as the AUDIT-C. A score of 5+ on AUDIT-C is general considered to indicate potentially risky levels of consumption. A score of 8+ on the full AUDIT indicates potentially hazardous alcohol use, a score of 16-19 indicates harmful drinking and 20+ suggests possible alcohol dependence[8].

Several published studies have used ATS data to identify an increase in levels of risky drinking during the pandemic[9,10], however these studies only used data up to July 2020. We used data from April 2014-November 2021 to assess how self-reported levels of risky drinking had changed across the course of the pandemic.

Figure 1 illustrates the results of this analysis. Using both the broader AUDIT-C and narrower full AUDIT definitions, the proportion of adults in England drinking at risky levels has risen significantly during the pandemic compared to the preceding 6 years. Although there is some suggestion in the AUDIT-C data that this proportion fell after a spike during the first lockdown in the spring of 2020, any fall has since reversed and the full AUDIT data suggests that the increase in risky drinking has been sustained over the entirety of the pandemic.

Figure 1 - Monthly prevalence of self-reported risky drinking in England



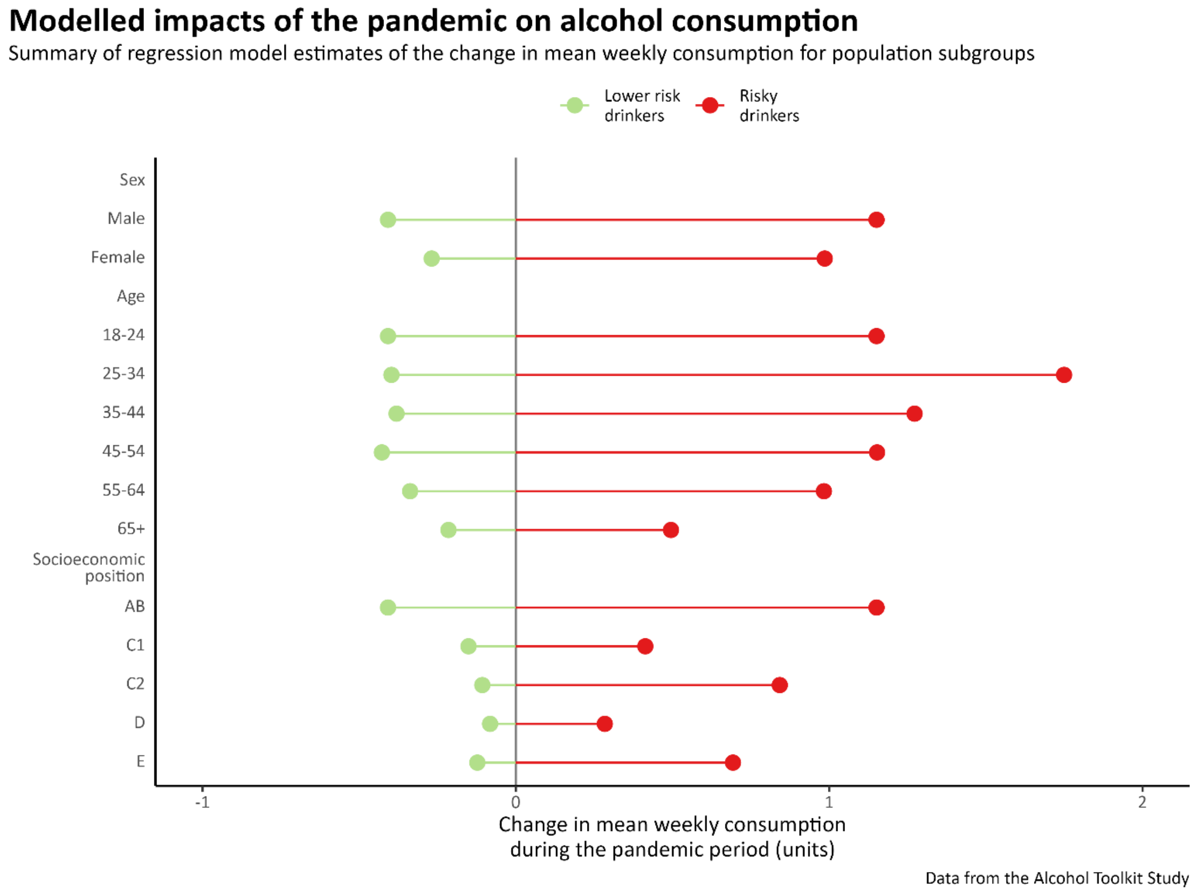
Further analysis of the ATS data, presented in the appendix to this report, shows, in line with the wider evidence, that overall alcohol consumption has increased even though lower risk drinkers may be drinking less on average. However, we are not only interested in differential changes in drinking during the pandemic by pre-pandemic drinking level, but also by sociodemographic variables – age, sex and socioeconomic position.

In order to quantify the associations between changes in drinking behaviour and each of these factors, we fitted Ordinary Least Squares regression models. As there was little evidence in the data of a clear trend in mean consumption or AUDIT scores *during* the pandemic period itself, we pooled data for the 19 monthly waves available during the pandemic (April 2020 – November 2021) and compared it to pooled data for the equivalent period 2 years prior (April 2018 – November 2019) to control for any seasonality in drinking patterns.

The fitted models estimated weekly mean alcohol consumption as a function of pandemic period (i.e. pre- or during the pandemic), social grade (categorised on the basis of occupation from AB – “higher/intermediate managerial, administrative or professional” to E – “Casual or lowest grade workers, pensioners and others who depend on the welfare state for their income” [11]), sex, age (categorised as 18-24, 25-34, 35-44, 45-54, 55-64, 65+) as well as interaction terms between pandemic period and all sociodemographic variables to allow for differential changes in drinking during the pandemic for each group. Models were fitted with R statistical software using the {survey} package to account for survey weights[12]. In order to allow for the possibility of polarisation in drinking behaviour, separate models were fitted for lower risk and risky drinkers (categorised on the basis of AUDIT-C scores of 5+).

The full results of these regression models are presented in full in Table 12 and Figure 25 in the appendix to this report, but Figure 2 provides a summary of the key figures. Across all population subgroups, lower risk drinkers reduced their drinking during the pandemic, while risky drinkers increased theirs. This polarisation was greater among men than women, with male lower risk drinkers seeing bigger reductions in consumption and male risky drinkers seeing bigger increases. Older drinkers reduced their drinking by less than younger drinkers if they were drinking at lower-risk levels pre-pandemic while among those drinking at risky levels pre-pandemic, the biggest increases were seen among 25-34 year olds. Lower risk drinkers in the highest socioeconomic group reduced their drinking by more than those in other groups. Among risky drinkers the socioeconomic pattern is more complex, with the biggest increases in drinking seen among the highest, middle and lowest socioeconomic groups.

Figure 2: Summary of modelled changes in alcohol consumption for population subgroups during the pandemic



The Sheffield Alcohol Policy Model

The Sheffield Alcohol Policy Model (SAPM) is a complex epidemiological model which has been widely used to prospectively appraise the potential impact of a wide range of alcohol policies including Minimum Unit Pricing and the delivery of Identification and Brief Advice[13,14]. SAPM was also used to inform the most recent revision of the UK Chief Medical Officers' low risk drinking guidelines[15] and the latest revision of the Australian drinking guidelines[16].

A comprehensive description of the modelling methodology used in SAPM can be found elsewhere[17,18]. Briefly, the model consists of two, interlinked components: one model linking policy to changes in alcohol consumption and a second, epidemiological model linking changes in consumption to changes in health harms. For the present analysis we used only the latter model. In this model, changes in alcohol consumption are linked to changes in risks of mortality and morbidity of 45 different alcohol-related health conditions, using data on current prevalence of each condition and epidemiological evidence linking alcohol consumption levels to harm[19] and accounting for delays between changes in drinking and changes in risk[5].

The model is stratified throughout by age, sex and deprivation (measured as quintiles of the Index of Multiple Deprivation (IMD)), allowing the impact of a policy on different subgroups in the population to be examined in detail. The primary sources for the data used in the model are detailed below in Table 1.

Table 1 - Data sources for the country-specific adaptations of SAPM

Data	**England**
Pre-pandemic alcohol consumption	Health Survey for England (HSE) 2018 and 2019
Changes in alcohol consumption during the pandemic	Alcohol Toolkit Study (ATS) 2018-2021
Alcohol-related and all-cause deaths	Office for National Statistics mortality records 2012-16 (England)
Admissions	Hospital Episode Statistics (HES) 2012/13-16/17 (England)
Healthcare costs	Condition-specific cost estimates[14] inflated to 2019 prices using healthcare-specific inflation[20]

The baseline year for all model runs is 2019. For all of the individuals in the model, alcohol consumption in 2020 and 2021 (i.e. the pandemic period) is modelled by using the results of the regressions fitted on the ATS data to give predicted pre-pandemic and pandemic period consumption according to each individual's baseline drinking and sociodemographic characteristics, then adjusting their observed baseline consumption level (i.e. the volume of alcohol consumption recorded in the HSE) by the ratio between the two. So if the regression model predicts that pandemic consumption will be 5% higher than pre-pandemic levels according to their individual characteristics, then we assume their consumption increases by 5% in 2020 and 2021. In the absence of a robust mapping between social grade and the Index of Multiple Deprivation, we assume that the five categories in each map directly onto each other.

Modelling future alcohol consumption

Whilst we have data on alcohol consumption during the first two years of the pandemic, assumptions are required about how the changes in drinking that we have seen over this period might persist. As society (hopefully) returns to normal, will people retain the drinking habits they have acquired during the pandemic? Drinking has been shifting from the on-trade to the off-trade for several decades[21], so the enforced shift towards home drinking in the past two years could simply become an accelerated conclusion to that trend. Alternatively, as the on-trade reopens more fully, people may retain their new home drinking habits while also adding back some of the on-trade consumption they have missed during the pandemic.

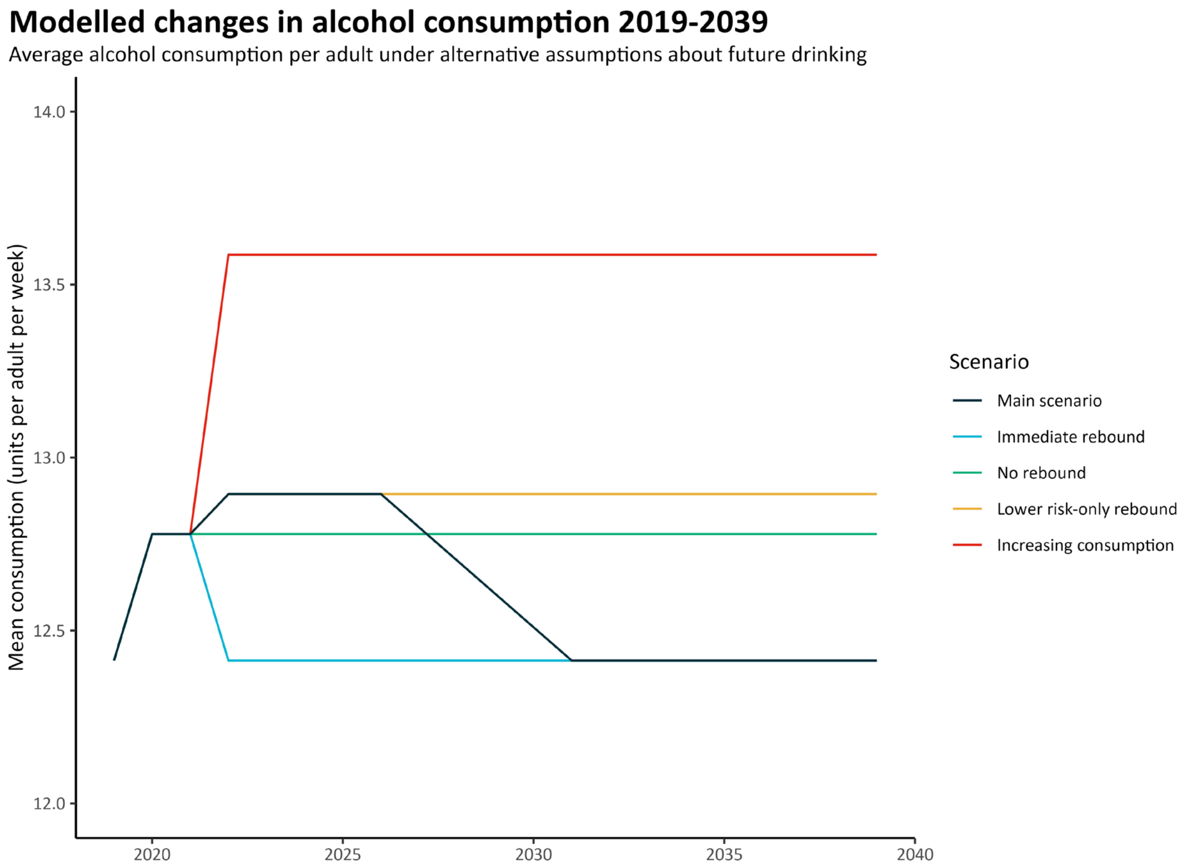
We held a workshop with stakeholders in NHS England and OHID to identify a set of plausible alternative scenarios. The results of this workshop were 5 scenarios, one main and four more- or less-optimistic alternatives. The main scenario is chosen for illustrative purposes and does not reflect a forecast of the relative likelihood of each scenario.

The main scenario is a "slower heavier rebound", where lower risk drinkers (those drinking within the current UK drinking guidelines of 14 units per week on average) return to their pre-pandemic (i.e. 2019) levels of drinking from 2022. Heavier drinkers remain at their pandemic levels for a further 5 years, before gradually returning to pre-pandemic levels over the following 5 years. The four alternative scenarios are:

1. Immediate Rebound: all drinkers return to their pre-pandemic levels of drinking from 2022 and thereafter their drinking remains constant at 2019 levels (after adjusting for age).
2. No Rebound: all drinkers keep consuming alcohol at the same level as during the pandemic period (adjusting for age).
3. Lower Risk-Only Rebound: Lower risk drinkers return to pre-pandemic levels from 2022 onwards, while heavier drinkers continue to drink at the same level as during the pandemic.
4. Increasing Consumption: From 2022 onwards, all drinkers who reduced their drinking during the pandemic return to pre-pandemic levels. Drinkers who increased their drinking during the pandemic increase it further, reflecting lost on-trade consumption being added back into people's drinking habits. This further increase takes the form of the smaller value of: i) either the same increase again as was seen between 2019 and 2020, or ii) the total volume of on-trade consumption pre-pandemic.

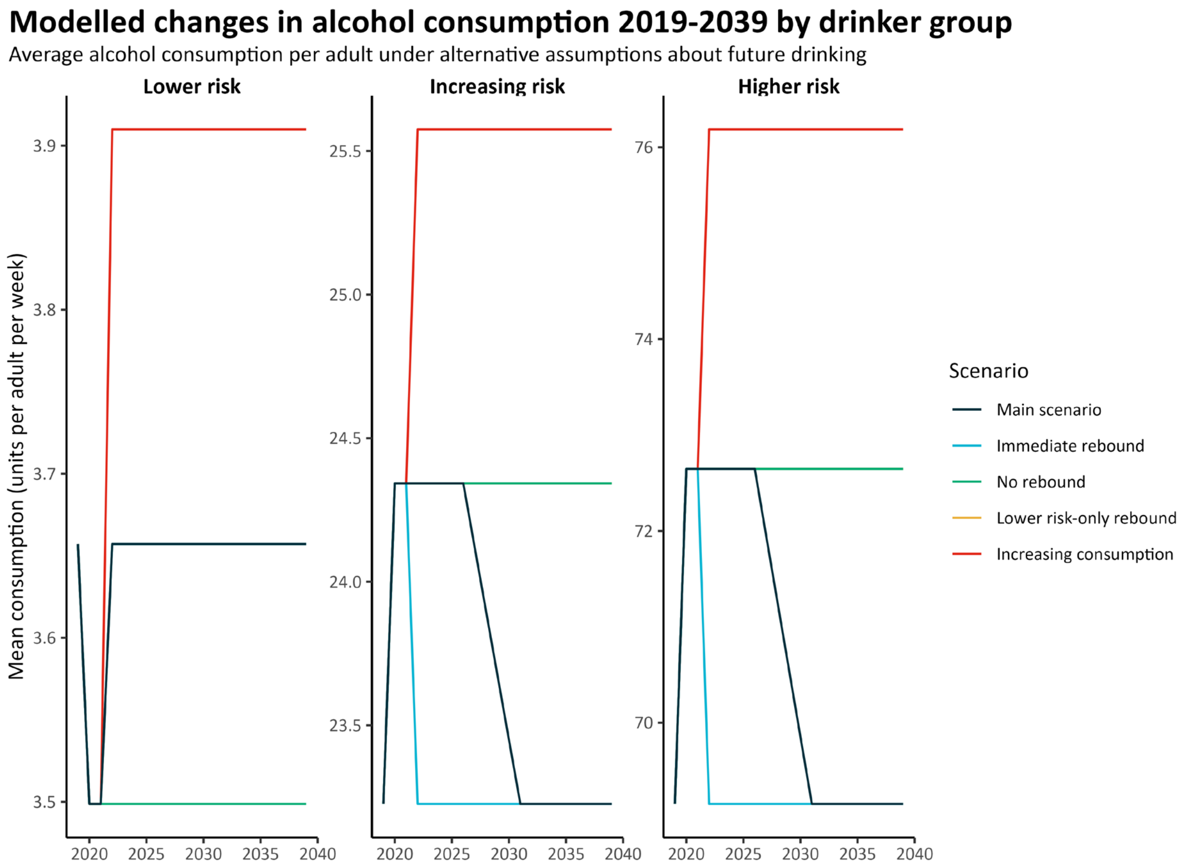
The impact of each of these scenarios on overall per capita alcohol consumption is illustrated in Figure 3.

Figure 3 - Estimated changes in per capita alcohol consumption 2019-2021 and modelled scenarios for future consumption



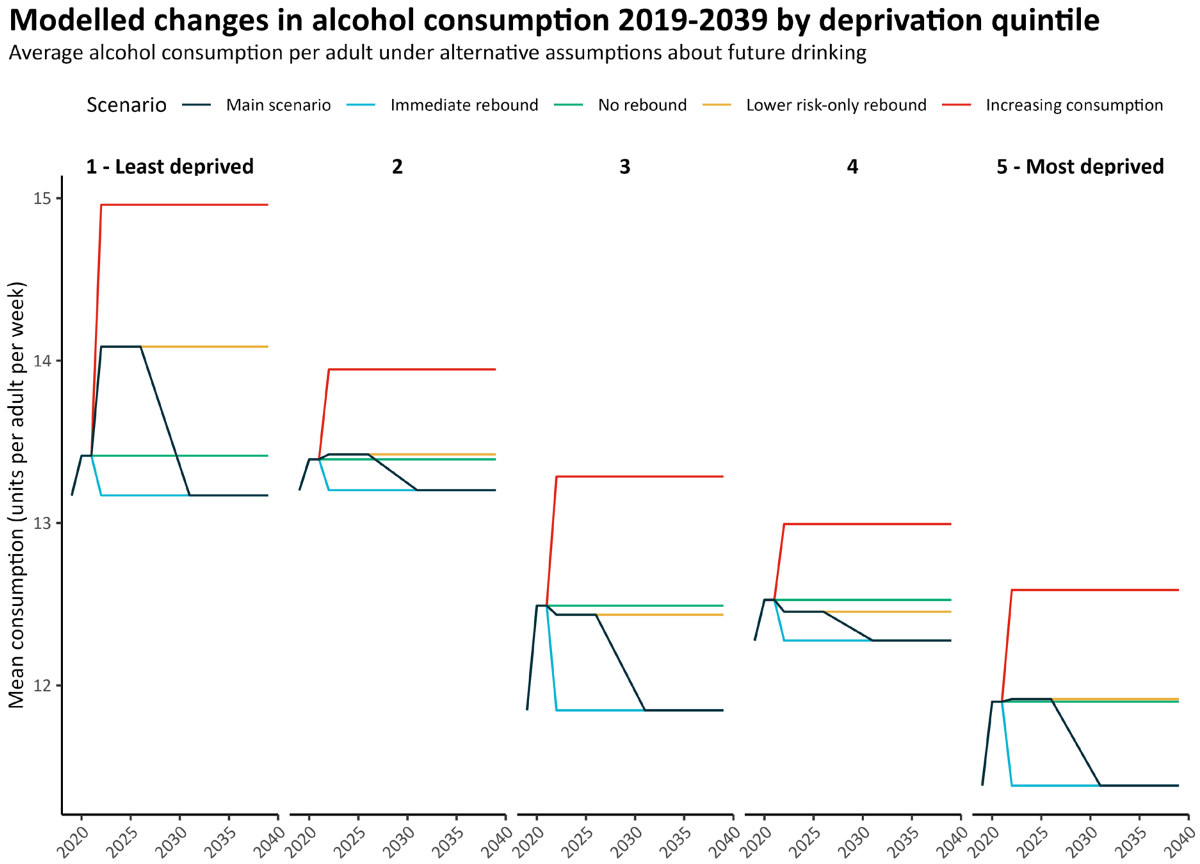
The extent to which the impact of each scenario differs between drinker groups is illustrated by Figure 4. Lower risk drinkers are those drinking within the UK drinking guidelines of 14 units per week. Increasing risk drinkers are those exceeding the guidelines, but drinking no more than 35 units per week for women and 50 units for men. Higher risk drinkers are those consuming above those levels. This plot highlights the fact that lower risk drinkers have, on average, reduced their drinking during the pandemic, while heavier drinkers have increased it.

Figure 4 - Estimated changes in alcohol consumption 2019-2021 and modelled scenarios for future consumption by drinker group



A similar plot, but separating out the impact by deprivation quintiles, in Figure 5 illustrates that, in general, more deprived groups drink less, on average, than less deprived ones. It also highlights how the differences in the number of lower risk, increasing and higher risk drinkers in each quintile lead to different patterns in the main scenario. In the least deprived group alcohol consumption rises slightly during 2020/21 and then rises further as the lower risk drinkers return to their 2019 levels of consumption, while the heavier drinkers remain at their elevated 2020/21 levels. In contrast, in the most deprived group alcohol consumption rises by more during 2020/21, but the effect of lower risk drinkers rebounding to 2019 levels in 2022 is much smaller.

Figure 5 - Estimated changes in per capita alcohol consumption 2019-2021 and modelled scenarios for future consumption by IMD quintile



'All else being equal'

In this study we have focused on modelling the potential impact of changes in consumption due to the COVID-19 pandemic. In reality, levels of alcohol consumption and harm are influenced by a range of demographic, social, cultural and economic factors. In order to isolate the effect of government pricing policies, all of these are left out of the model. As such, the Sheffield Alcohol Policy Model adopts a 'ceteris paribus' or 'all else being equal' approach, assuming that the modelled changes in alcohol consumption arising from the pandemic and our scenarios about alternative future drinking patterns are the only factors influencing future drinking levels. The model does account for changes in the age structure of the population over time, but we assume that, beyond the impact of the pandemic, the alcohol consumption of each age group remains the same. We do not therefore, account for any cohort effects – the idea that drinkers take their drinking patterns with them as they age.

The results of our analyses should therefore not be viewed as forecasts of what *will* happen, but rather illustrations of how alcohol-related harm would develop under these specific assumptions. For all results presented in this report, our counterfactual is a scenario where alcohol consumption had continued at 2019 levels in perpetuity.

For each scenario, we run SAPM for 20 years to allow for the full impact of changes in alcohol consumption on health to be seen.

Results

Population-level impacts

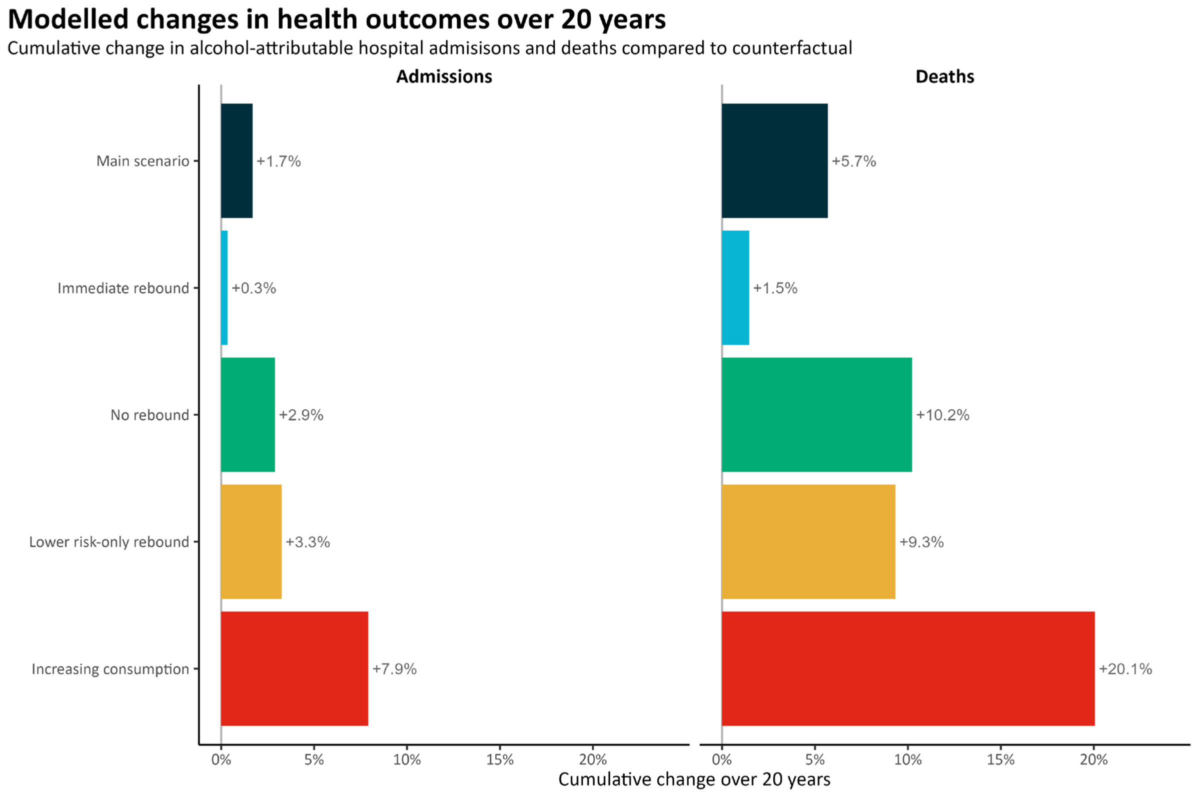
The overall cumulative number of hospital admissions and deaths between 2019 and 2039 under each modelled scenario compared to a counterfactual where consumption remained at 2019 levels throughout are shown in Table 2 and Figure 6. These show that in our main scenario we would expect 207,597 additional alcohol-attributable hospital admissions over these 20 years compared to the counterfactual, a 1.7% increase. Over the same period we also estimate an additional 7,153 alcohol-attributable deaths, a 5.7% increase.

Even under the most optimistic scenario, where alcohol consumption rebounds to 2019 levels immediately in 2022, we would expect 42,677 additional hospital admissions (+0.3%) and 1,830 additional deaths (+1.5%) as a result of changes in alcohol consumption during the pandemic period. Meanwhile, under the most pessimistic scenario, where alcohol consumption rises again as COVID restrictions are relaxed further and on-trade consumption increases again, we estimate an additional 972,382 alcohol-attributable hospital admissions (+7.9%) and 25,192 additional deaths (+20.1%).

Table 2 - Cumulative changes in health outcomes over 20 years compared to baseline

Scenario	Counterfactual	Difference	% Difference	Mean Annual Difference
Admissions				
Main scenario	12,289,237	207,597	1.7%	10,380
Immediate rebound	12,289,237	42,677	0.3%	2,134
No rebound	12,289,237	355,832	2.9%	17,792
Lower risk-only rebound	12,289,237	400,198	3.3%	20,010
Increasing consumption	12,289,237	972,382	7.9%	48,619
Deaths				
Main scenario	125,581	7,153	5.7%	358
Immediate rebound	125,581	1,830	1.5%	92
No rebound	125,581	12,849	10.2%	642
Lower risk-only rebound	125,581	11,715	9.3%	586
Increasing consumption	125,581	25,192	20.1%	1,260

Figure 6 - Cumulative changes in alcohol-attributable admissions and deaths over 20 years compared to baseline



These figures represent the cumulative impact of changes in consumption over time. But we would not expect these impacts to be equally spread over the period between 2019 and 2039. For some outcomes changes will be immediate, while for others the health impacts can take years to develop. This is demonstrated in Figure 7, which shows the annual difference from the counterfactual, in terms of alcohol-attributable admissions and deaths, for each scenario. Overall, a greater proportion of hospital admissions compared to deaths are for alcohol-related health conditions with little or no delay between changes in drinking and changes in risk. This means that in our main scenario, even though drinking returns to 2019 levels by 2026, alcohol-attributable deaths are estimated to still be substantially higher in 2039 than they would have been if drinking had remained at 2019 levels throughout.

Similarly, even in the scenario where alcohol consumption in 2022 reverts to 2019 levels, hospital admissions will fall back within a couple of years to similar levels to where they would have been if drinking had remained consistent at 2019 levels, while we will continue to see alcohol-attributable deaths at elevated (albeit lower than 2022) levels for many years to come.

Figure 7 - Estimated annual changes in alcohol-attributable admissions and deaths compared to baseline

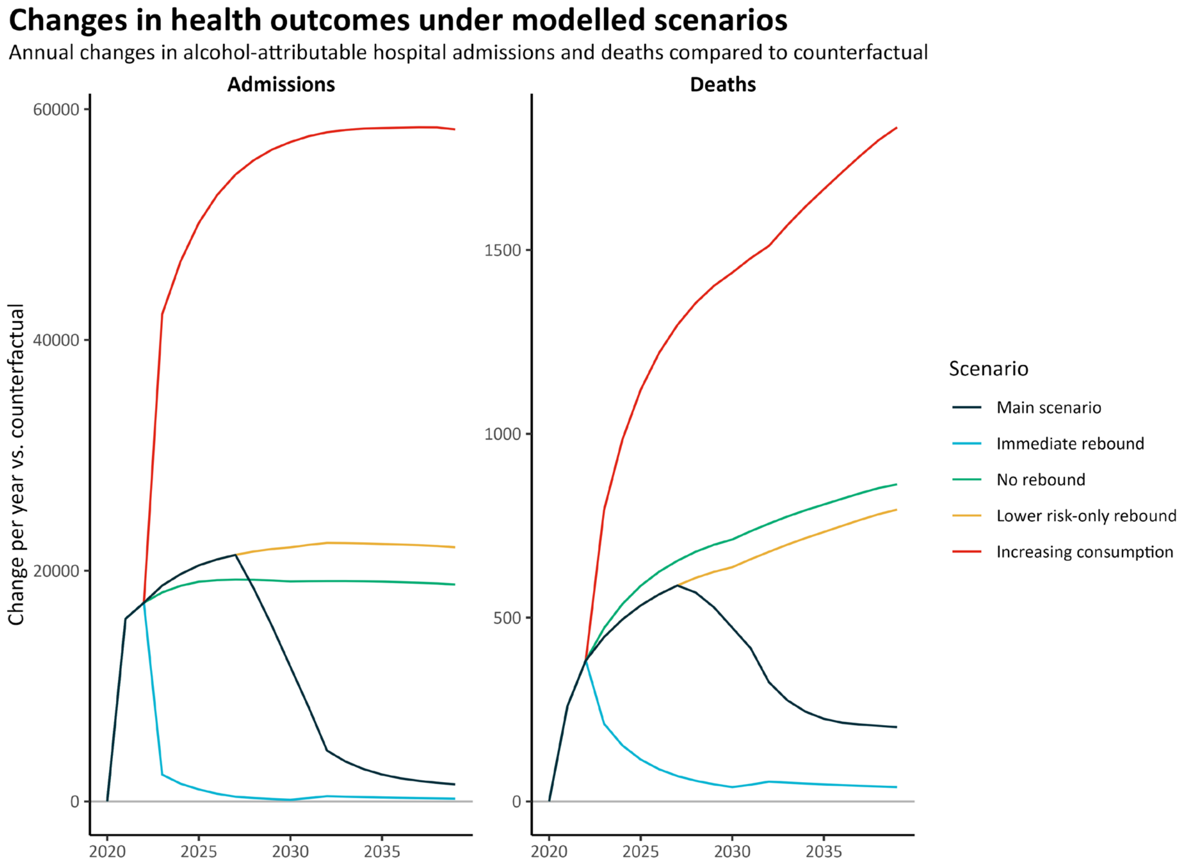


Figure 8 and Figure 9 break these results down further into health condition groups. For alcohol-attributable hospital admissions, the largest single cause is admissions related to alcohol dependence (ICD-10 code F10), with smaller contributions from injuries and digestive diseases (primarily liver disease). For deaths, digestive diseases make up the largest single cause, followed by cardiovascular diseases (heart disease, strokes etc.). Toward the end of the modelled period, alcohol-attributable cancers, which have the longest lag time between changes in exposure and changes in risk, also begin to feature. The underlying numbers behind these figures are shown in

Detailed model results

Table 13 and Table 14 in the appendix to this report.

Figure 8 - Estimated annual changes in alcohol-attributable admissions by condition group compared to baseline

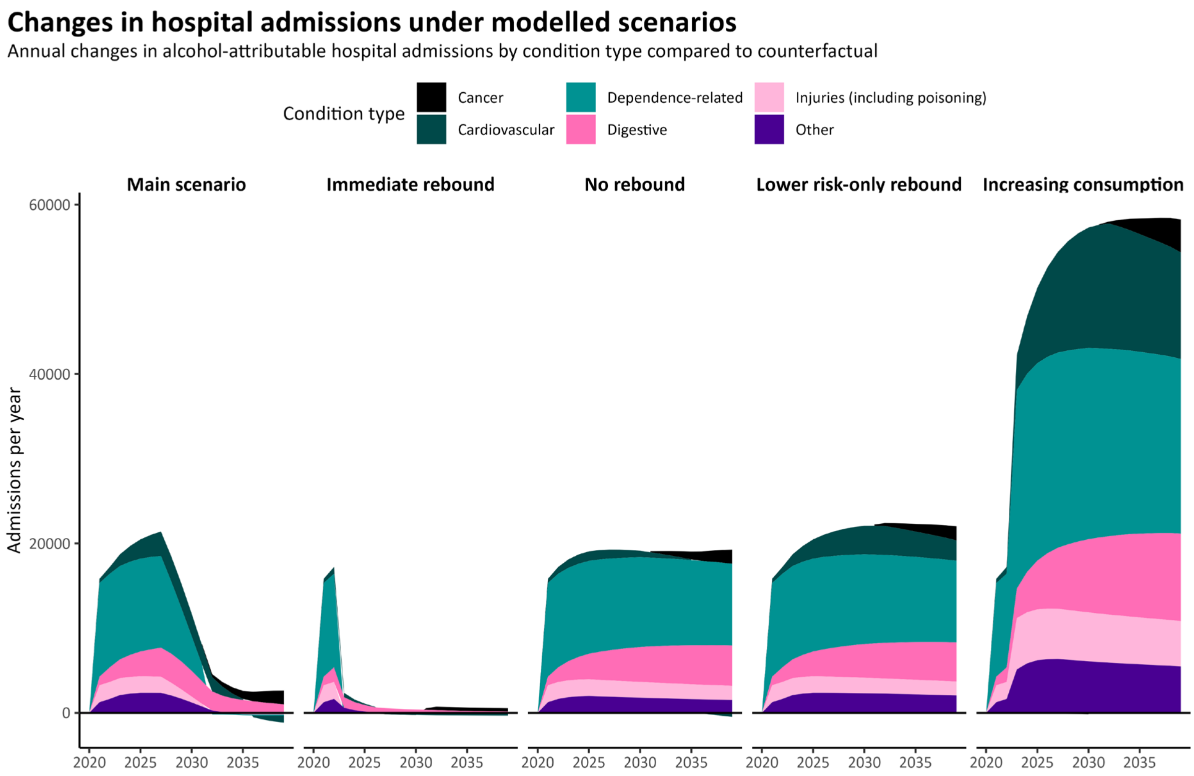
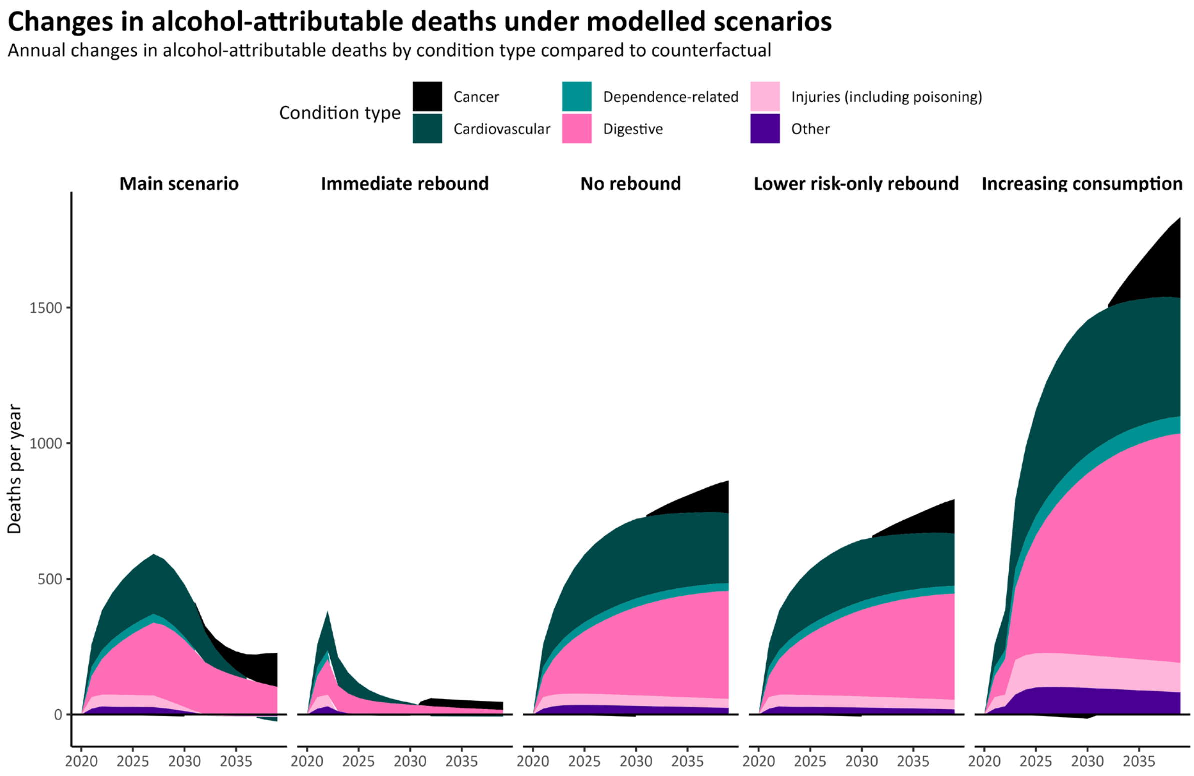


Figure 9 - Estimated annual changes in alcohol-attributable deaths by condition group compared to baseline



Subgroup impacts

Moving on to the impacts of changes in alcohol consumption by population subgroup, Table 3 shows the difference between drinking groups (lower risk, increasing risk and higher risk) of cumulative changes in alcohol-attributable hospital admissions for each scenario. In absolute terms, the largest number of additional hospital admissions in each scenario occurs in the increasing risk group, however once you adjust for population size, the biggest increase in the admission rates can be seen amongst higher risk drinkers, as shown in Figure 10.

Under the main scenario and three of the four other modelled scenarios, the total number of alcohol-attributable hospital admissions between 2019-2039 among lower risk drinkers is estimated to fall slightly. This arises due to lower risk alcohol consumption being mildly protective for some cardiovascular health conditions, although these benefits are widely disputed as discussed in the Discussion. Similar patterns for alcohol-attributable deaths can be seen in Table 4 and Figure 11, although here all scenarios see an estimated increase in alcohol-attributable mortality for all drinker groups, however this increase is set against the fact that overall alcohol is estimated to *prevent* 54,941 deaths among lower risk drinkers at baseline over the modelled period.

Figure 10 - Estimated changes in cumulative alcohol-attributable hospital admissions rates by drinker group

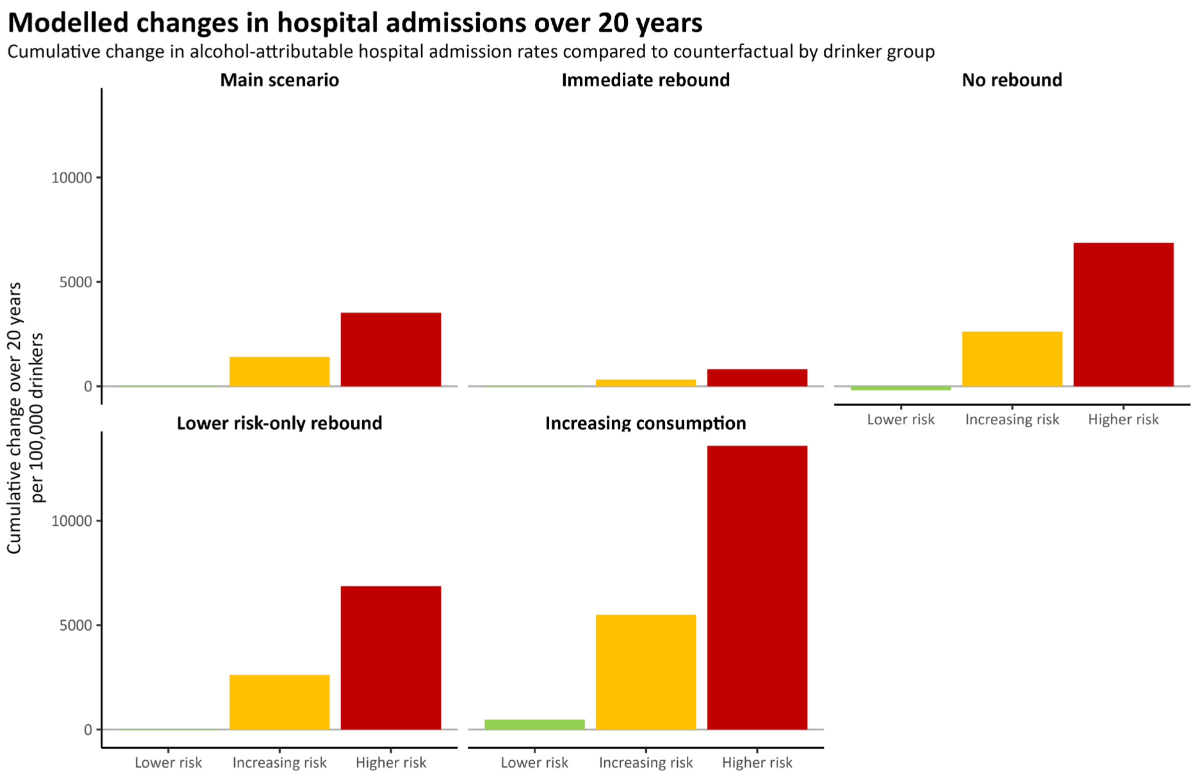


Table 3 - Modelled changes in cumulative alcohol attributable hospital admissions over 20 years by drinker group

			Cumulative change vs. counterfactual		
	Population	Counterfactual	Difference	Per 100,000	% Difference
Main scenario					
Lower risk	28,353,152	1,268,681	−8,606	−30	−0.7%
Increasing risk	9,320,630	5,655,224	131,751	1,414	2.3%
Higher risk	2,396,378	5,365,333	84,452	3,524	1.6%
Immediate rebound					
Lower risk	28,353,152	1,268,681	−7,540	−27	−0.6%
Increasing risk	9,320,630	5,655,224	30,570	328	0.5%
Higher risk	2,396,378	5,365,333	19,648	820	0.4%
No rebound					
Lower risk	28,353,152	1,268,681	−53,316	−188	−4.2%
Increasing risk	9,320,630	5,655,224	244,526	2,623	4.3%
Higher risk	2,396,378	5,365,333	164,622	6,870	3.1%
Lower risk-only rebound					
Lower risk	28,353,152	1,268,681	−8,889	−31	−0.7%
Increasing risk	9,320,630	5,655,224	244,484	2,623	4.3%
Higher risk	2,396,378	5,365,333	164,603	6,869	3.1%
Increasing consumption					
Lower risk	28,353,152	1,268,681	134,530	474	10.6%
Increasing risk	9,320,630	5,655,224	512,198	5,495	9.1%
Higher risk	2,396,378	5,365,333	325,654	13,589	6.1%

Figure 11 - Estimated changes in cumulative alcohol-attributable death rates by drinker group

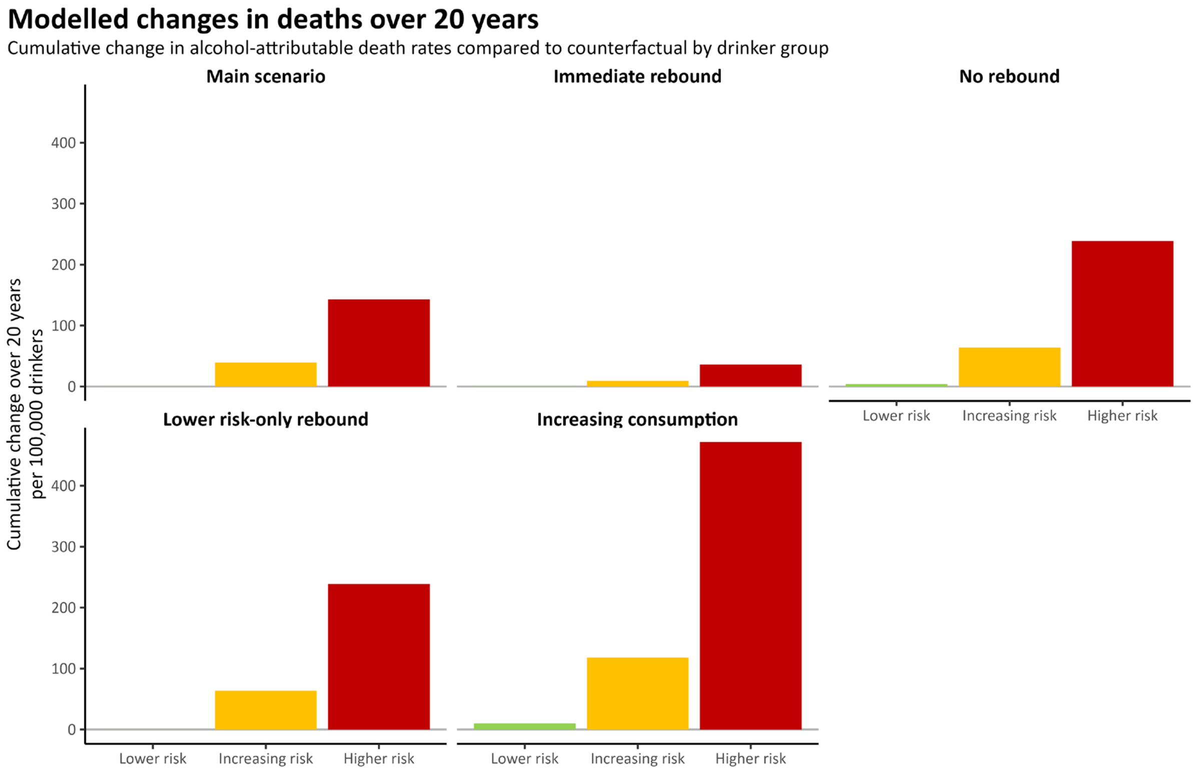


Table 4 - Modelled changes in cumulative alcohol attributable deaths over 20 years by drinker group

	Population	Counterfactual	Cumulative change vs. counterfactual		
			Difference	Per 100,000	% Difference
Main scenario					
Lower risk	28,353,152	−54,941	53	0	−0.1%
Increasing risk	9,320,630	42,229	3,671	39	8.7%
Higher risk	2,396,378	138,293	3,429	143	2.5%
Immediate rebound					
Lower risk	28,353,152	−54,941	92	0	−0.2%
Increasing risk	9,320,630	42,229	873	9	2.1%
Higher risk	2,396,378	138,293	866	36	0.6%
No rebound					
Lower risk	28,353,152	−54,941	1,175	4	−2.1%
Increasing risk	9,320,630	42,229	5,952	64	14.1%
Higher risk	2,396,378	138,293	5,723	239	4.1%
Lower risk-only rebound					
Lower risk	28,353,152	−54,941	42	0	−0.1%
Increasing risk	9,320,630	42,229	5,950	64	14.1%
Higher risk	2,396,378	138,293	5,722	239	4.1%
Increasing consumption					
Lower risk	28,353,152	−54,941	2,879	10	−5.2%
Increasing risk	9,320,630	42,229	11,007	118	26.1%
Higher risk	2,396,378	138,293	11,307	472	8.2%

The differential impact on men and women of all five modelled scenarios is shown in Figure 12 and Table 5 for alcohol-attributable hospital admissions and Figure 13 and Table 6 for alcohol-attributable deaths. The counterfactual scenario highlights that based on 2019 levels of drinking, men have 3 times as many alcohol-related hospital admissions and twice as many alcohol-related deaths. As a result, while the main scenario finds a much larger absolute increase in both hospital admissions and deaths among men than women, the relative picture is rather different, with a bigger relative increase in alcohol-attributable hospital admissions for women than men (+2.6% vs. +1.4%) and similar increases in alcohol-attributable deaths (+5.3% vs. +5.9%). These patterns are broadly similar across the four alternative scenarios.

Figure 12 - Estimated changes in cumulative alcohol-attributable admission rates by sex

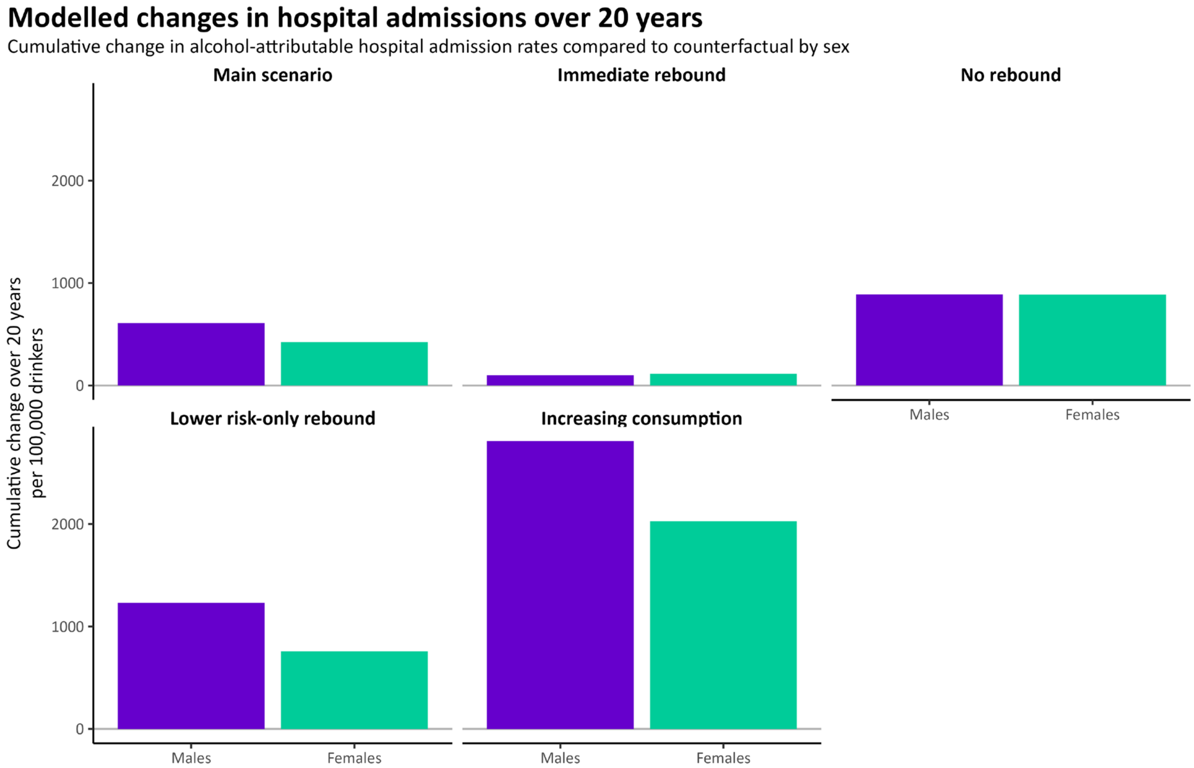


Table 5 - Modelled changes in cumulative alcohol-attributable admissions by sex

	Population	Counterfactual	Cumulative change vs. counterfactual		
			Difference	Per 100,000	% Difference
Main scenario					
Males	20,411,957	9,023,474	124,192	608	1.4%
Females	19,658,204	3,265,764	83,405	424	2.6%
Immediate rebound					
Males	20,411,957	9,023,474	20,352	100	0.2%
Females	19,658,204	3,265,764	22,325	114	0.7%
No rebound					
Males	20,411,957	9,023,474	181,410	889	2.0%
Females	19,658,204	3,265,764	174,422	887	5.3%
Lower risk-only rebound					
Males	20,411,957	9,023,474	251,147	1,230	2.8%
Females	19,658,204	3,265,764	149,051	758	4.6%
Increasing consumption					
Males	20,411,957	9,023,474	573,732	2,811	6.4%
Females	19,658,204	3,265,764	398,651	2,028	12.2%

Figure 13 - Estimated changes in cumulative alcohol-attributable death rates by sex

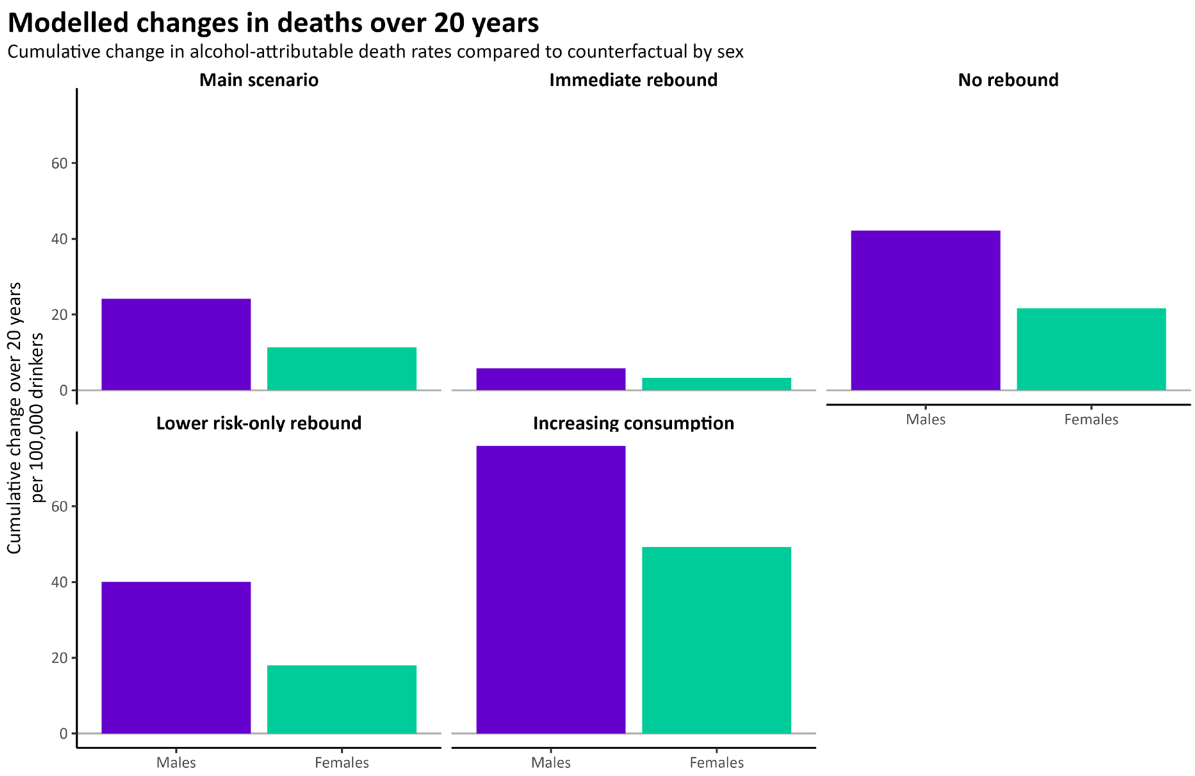


Table 6 - Modelled changes in cumulative alcohol-attributable deaths by sex

			Cumulative change vs. counterfactual		
	Population	Counterfactual	Difference	Per 100,000	% Difference
Main scenario					
Males	20,411,957	83,967	4,932	24	5.9%
Females	19,658,204	41,614	2,220	11	5.3%
Immediate rebound					
Males	20,411,957	83,967	1,184	6	1.4%
Females	19,658,204	41,614	646	3	1.6%
No rebound					
Males	20,411,957	83,967	8,606	42	10.2%
Females	19,658,204	41,614	4,243	22	10.2%
Lower risk-only rebound					
Males	20,411,957	83,967	8,171	40	9.7%
Females	19,658,204	41,614	3,543	18	8.5%
Increasing consumption					
Males	20,411,957	83,967	15,508	76	18.5%
Females	19,658,204	41,614	9,684	49	23.3%

We can also look at how the impacts of each scenario differ across age groups. These differences are shown in Figure 14 and Table 7 for hospital admissions and Figure 15 and Table 8 for deaths. The counterfactual scenario shows that, based on 2019 levels of drinking, older age groups have much higher rates of alcohol-related hospital admissions and deaths. However, the patterns of changing alcohol consumption across the pandemic mean that in our main scenario, and three of the four alternative scenarios, we estimate the largest increase in hospital admissions to be among 25-34 year-olds. Only in the most pessimistic scenario do we estimate hospital admissions to increase the most in the oldest age group. Modelled results for alcohol-attributable deaths look somewhat different, with older age groups seeing the biggest absolute increase in alcohol-attributable mortality under all 5 scenarios, although 25-34 year olds are still estimated to see the largest relative rise.

Figure 14- Estimated changes in cumulative alcohol-attributable hospital admission rates by age

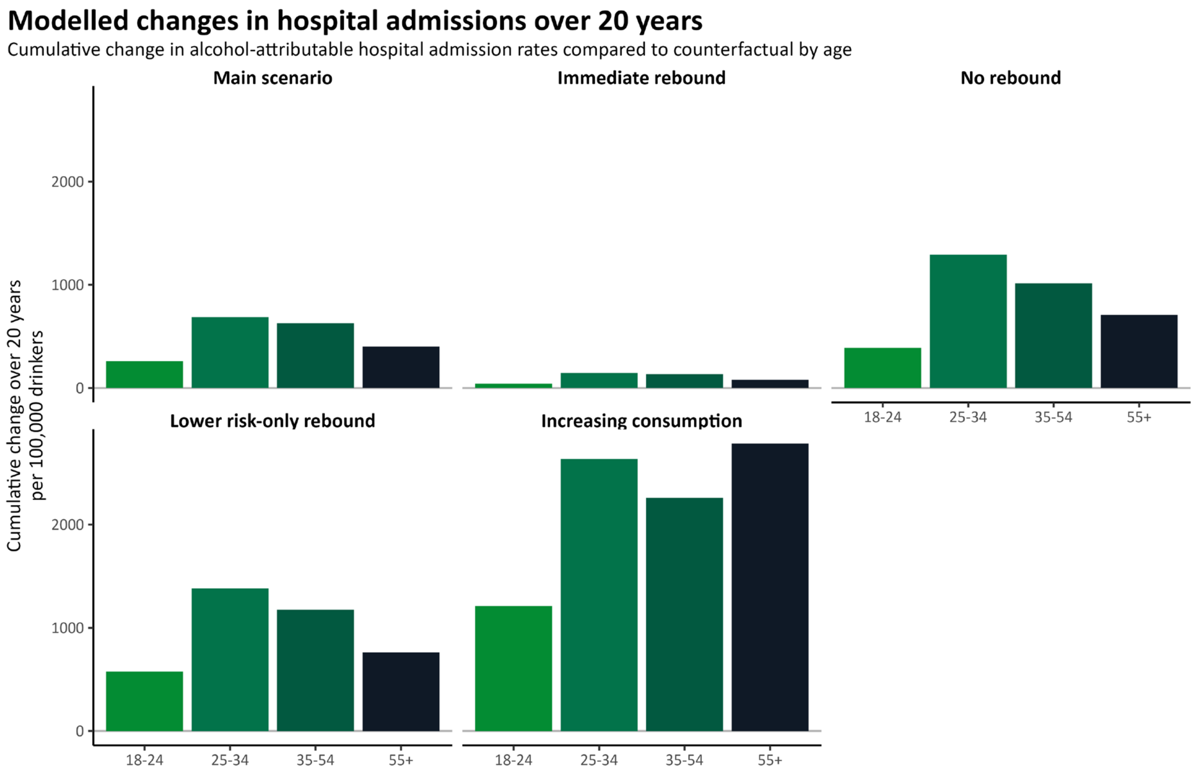


Table 7- Modelled changes in cumulative alcohol-attributable hospital admissions by age

	Population	Counterfactual	Cumulative change vs. counterfactual		
			Difference	Per 100,000	% Difference
Main scenario					
18-24	3,738,043	414,912	9,765	261	2.4%
25-34	7,006,269	752,662	48,146	687	6.4%
35-54	14,138,792	2,478,557	88,732	628	3.6%
55+	15,187,057	8,643,106	60,955	401	0.7%
Immediate rebound					
18-24	3,738,043	414,912	1,583	42	0.4%
25-34	7,006,269	752,662	10,151	145	1.3%
35-54	14,138,792	2,478,557	18,929	134	0.8%
55+	15,187,057	8,643,106	12,015	79	0.1%
No rebound					
18-24	3,738,043	414,912	14,558	389	3.5%
25-34	7,006,269	752,662	90,452	1,291	12.0%
35-54	14,138,792	2,478,557	143,316	1,014	5.8%
55+	15,187,057	8,643,106	107,506	708	1.2%
Lower risk-only rebound					
18-24	3,738,043	414,912	21,524	576	5.2%
25-34	7,006,269	752,662	96,887	1,383	12.9%
35-54	14,138,792	2,478,557	166,160	1,175	6.7%
55+	15,187,057	8,643,106	115,626	761	1.3%
Increasing consumption					
18-24	3,738,043	414,912	45,305	1,212	10.9%
25-34	7,006,269	752,662	184,624	2,635	24.5%
35-54	14,138,792	2,478,557	319,346	2,259	12.9%
55+	15,187,057	8,643,106	423,107	2,786	4.9%

Figure 15- Estimated changes in cumulative alcohol-attributable death rates by age

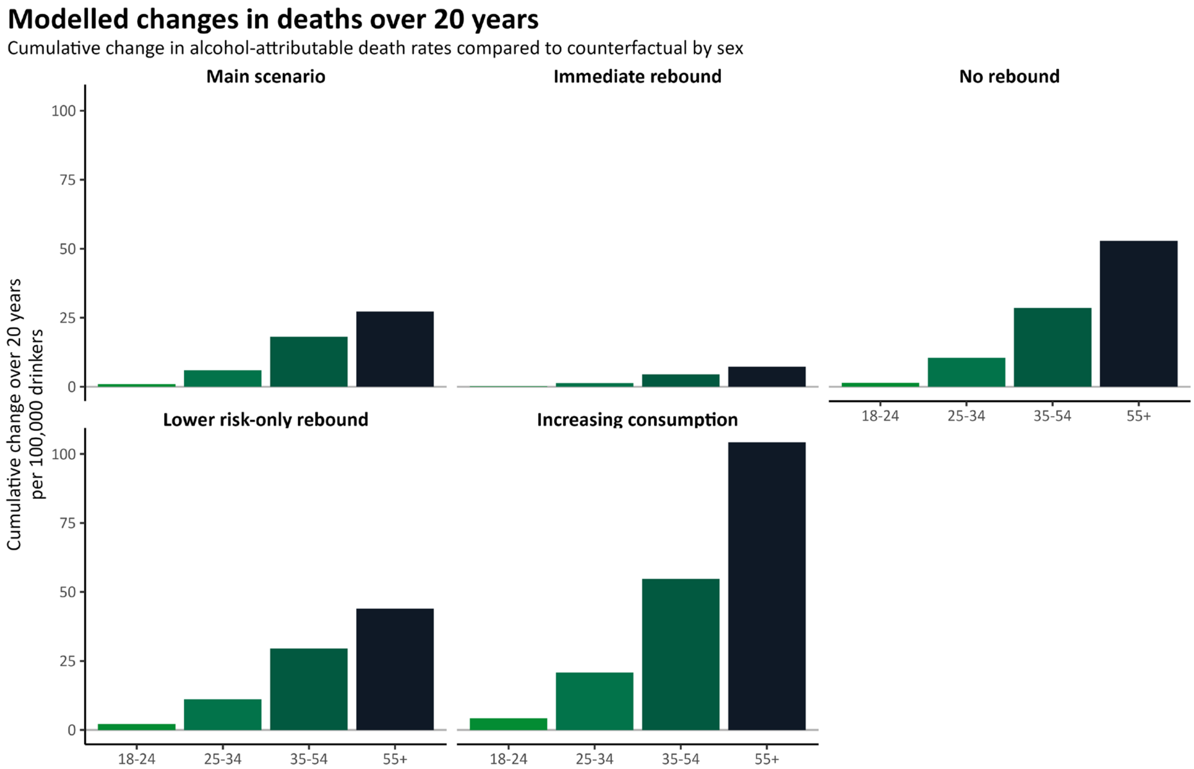


Table 8- Modelled changes in cumulative alcohol-attributable deaths by age

	Population	Counterfactual	Cumulative change vs. counterfactual		
			Difference	Per 100,000	% Difference
Main scenario					
18-24	3,738,043	1,650	37	1	2.2%
25-34	7,006,269	5,846	417	6	7.1%
35-54	14,138,792	42,090	2,563	18	6.1%
55+	15,187,057	75,995	4,136	27	5.4%
Immediate rebound					
18-24	3,738,043	1,650	6	0	0.4%
25-34	7,006,269	5,846	90	1	1.5%
35-54	14,138,792	42,090	639	5	1.5%
55+	15,187,057	75,995	1,096	7	1.4%
No rebound					
18-24	3,738,043	1,650	53	1	3.2%
25-34	7,006,269	5,846	735	10	12.6%
35-54	14,138,792	42,090	4,033	29	9.6%
55+	15,187,057	75,995	8,029	53	10.6%
Lower risk-only rebound					
18-24	3,738,043	1,650	80	2	4.9%
25-34	7,006,269	5,846	783	11	13.4%
35-54	14,138,792	42,090	4,177	30	9.9%
55+	15,187,057	75,995	6,675	44	8.8%
Increasing consumption					
18-24	3,738,043	1,650	159	4	9.6%
25-34	7,006,269	5,846	1,458	21	24.9%
35-54	14,138,792	42,090	7,744	55	18.4%
55+	15,187,057	75,995	15,831	104	20.8%

Next we look at the inequality impacts of each scenario. These results are shown in Figure 16 and Table 9 for alcohol-attributable admissions and Figure 17 and Table 10 for deaths. For both scenarios and across all outcomes, the biggest increases in harm as a result of changes in alcohol consumption during the pandemic are in the highest, middle and lowest quintile. In contrast to our findings for men and women, our results show that socioeconomic inequalities in the counterfactual scenario are considerably wider for alcohol-attributable deaths than hospital admissions. The most deprived quintile of the population experience over 3 times as many deaths caused by alcohol as the least deprived, in spite of having 20% fewer drinkers. This phenomenon is known as the 'Alcohol Harm Paradox'[22]. Inequalities in alcohol-attributable hospital admissions are narrower, although the most deprived quintile still experience 56% more admissions due to alcohol. These differences mean that for hospital admissions, both the absolute and relative impacts are highest, for most of the modelled scenarios, in the most deprived group. Whereas for alcohol-attributable deaths, the largest absolute increases in harm are in the most deprived group, but the biggest relative increases are in the least deprived.

Figure 16 - Estimated changes in cumulative alcohol-attributable admission rates by IMD quintile

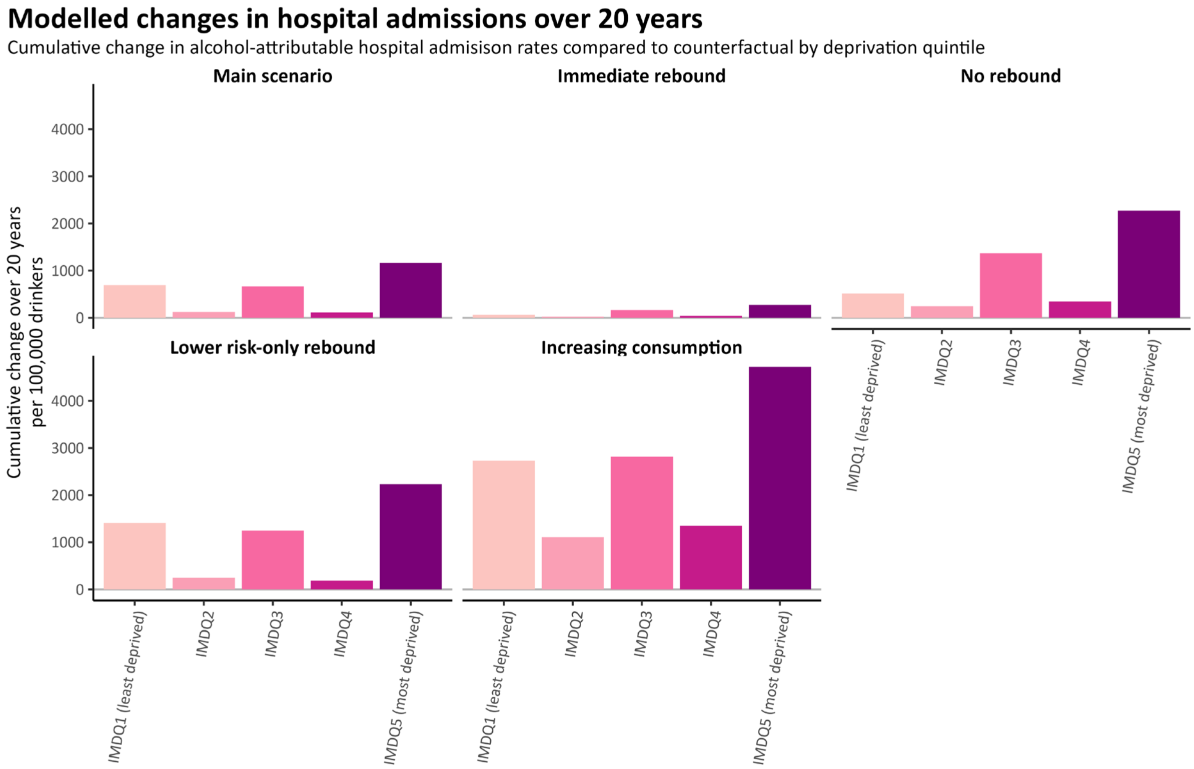


Table 9 - Modelled changes in cumulative alcohol-attributable admissions by IMD quintile

			Cumulative change vs. baseline		
	Population	Baseline	Difference	Per 100,000	% Difference
Main scenario					
IMDQ1 (least deprived)	7,982,919	1,993,777	55,306	693	2.8%
IMDQ2	8,689,563	2,283,162	10,739	124	0.5%
IMDQ3	8,762,929	2,259,794	58,274	665	2.6%
IMDQ4	8,281,878	2,643,264	9,276	112	0.4%
IMDQ5 (most deprived)	6,352,872	3,109,241	74,002	1,165	2.4%
Immediate rebound					
IMDQ1 (least deprived)	7,982,919	1,993,777	5,165	65	0.3%
IMDQ2	8,689,563	2,283,162	2,237	26	0.1%
IMDQ3	8,762,929	2,259,794	14,489	165	0.6%
IMDQ4	8,281,878	2,643,264	3,351	40	0.1%
IMDQ5 (most deprived)	6,352,872	3,109,241	17,436	274	0.6%
No rebound					
IMDQ1 (least deprived)	7,982,919	1,993,777	41,195	516	2.1%
IMDQ2	8,689,563	2,283,162	21,325	245	0.9%
IMDQ3	8,762,929	2,259,794	120,139	1,371	5.3%
IMDQ4	8,281,878	2,643,264	28,650	346	1.1%
IMDQ5 (most deprived)	6,352,872	3,109,241	144,524	2,275	4.6%
Lower risk-only rebound					
IMDQ1 (least deprived)	7,982,919	1,993,777	112,351	1,407	5.6%
IMDQ2	8,689,563	2,283,162	21,538	248	0.9%
IMDQ3	8,762,929	2,259,794	109,140	1,245	4.8%
IMDQ4	8,281,878	2,643,264	15,408	186	0.6%
IMDQ5 (most deprived)	6,352,872	3,109,241	141,761	2,231	4.6%
Increasing consumption					
IMDQ1 (least deprived)	7,982,919	1,993,777	217,749	2,728	10.9%
IMDQ2	8,689,563	2,283,162	96,357	1,109	4.2%
IMDQ3	8,762,929	2,259,794	246,766	2,816	10.9%
IMDQ4	8,281,878	2,643,264	111,611	1,348	4.2%
IMDQ5 (most deprived)	6,352,872	3,109,241	299,900	4,721	9.6%

Figure 17 - Estimated changes in cumulative alcohol-attributable death rates by IMD quintile

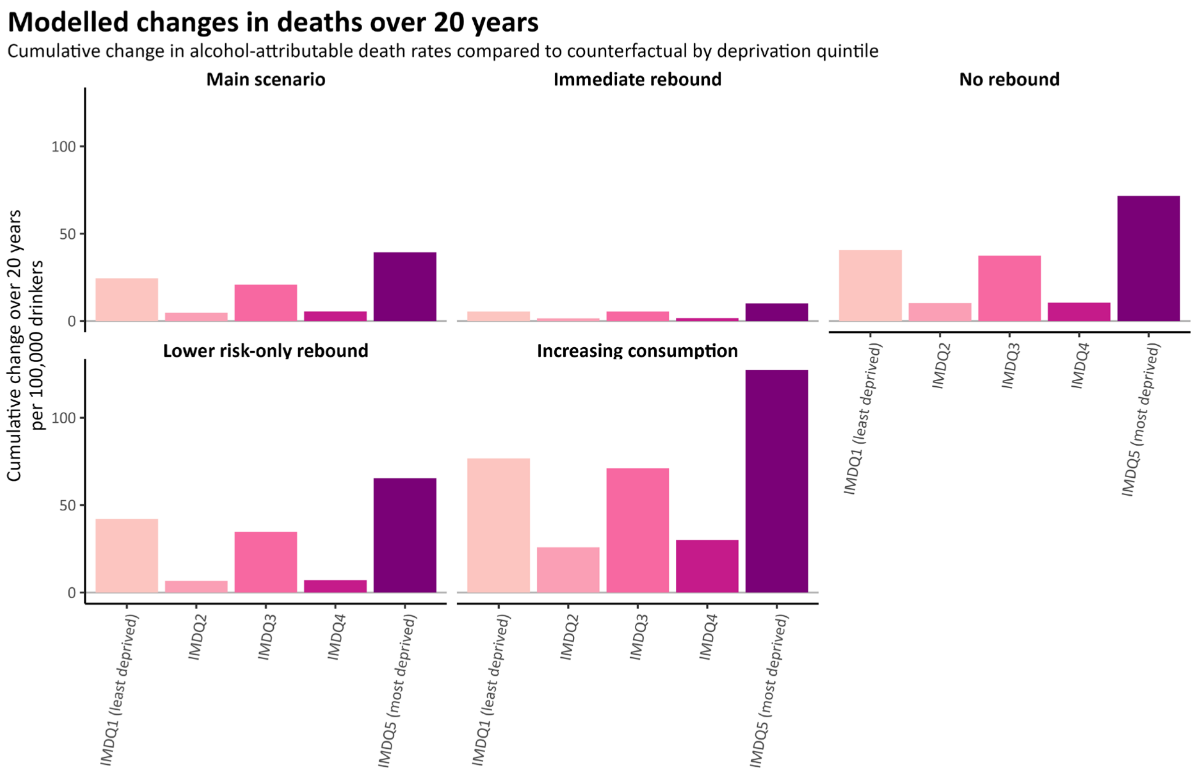


Table 10 - Modelled changes in cumulative alcohol-attributable deaths by IMD quintile

			Cumulative change vs. baseline		
	Population	Baseline	Difference	Per 100,000	% Difference
Main scenario					
IMDQ1 (least deprived)	7,982,919	13,157	1,956	25	14.9%
IMDQ2	8,689,563	20,175	411	5	2.0%
IMDQ3	8,762,929	18,998	1,827	21	9.6%
IMDQ4	8,281,878	29,898	454	5	1.5%
IMDQ5 (most deprived)	6,352,872	43,354	2,504	39	5.8%
Immediate rebound					
IMDQ1 (least deprived)	7,982,919	13,157	434	5	3.3%
IMDQ2	8,689,563	20,175	136	2	0.7%
IMDQ3	8,762,929	18,998	477	5	2.5%
IMDQ4	8,281,878	29,898	139	2	0.5%
IMDQ5 (most deprived)	6,352,872	43,354	643	10	1.5%
No rebound					
IMDQ1 (least deprived)	7,982,919	13,157	3,251	41	24.7%
IMDQ2	8,689,563	20,175	895	10	4.4%
IMDQ3	8,762,929	18,998	3,281	37	17.3%
IMDQ4	8,281,878	29,898	874	11	2.9%
IMDQ5 (most deprived)	6,352,872	43,354	4,548	72	10.5%
Lower risk-only rebound					
IMDQ1 (least deprived)	7,982,919	13,157	3,360	42	25.5%
IMDQ2	8,689,563	20,175	578	7	2.9%
IMDQ3	8,762,929	18,998	3,034	35	16.0%
IMDQ4	8,281,878	29,898	589	7	2.0%
IMDQ5 (most deprived)	6,352,872	43,354	4,153	65	9.6%
Increasing consumption					
IMDQ1 (least deprived)	7,982,919	13,157	6,133	77	46.6%
IMDQ2	8,689,563	20,175	2,251	26	11.2%
IMDQ3	8,762,929	18,998	6,235	71	32.8%
IMDQ4	8,281,878	29,898	2,486	30	8.3%
IMDQ5 (most deprived)	6,352,872	43,354	8,087	127	18.7%

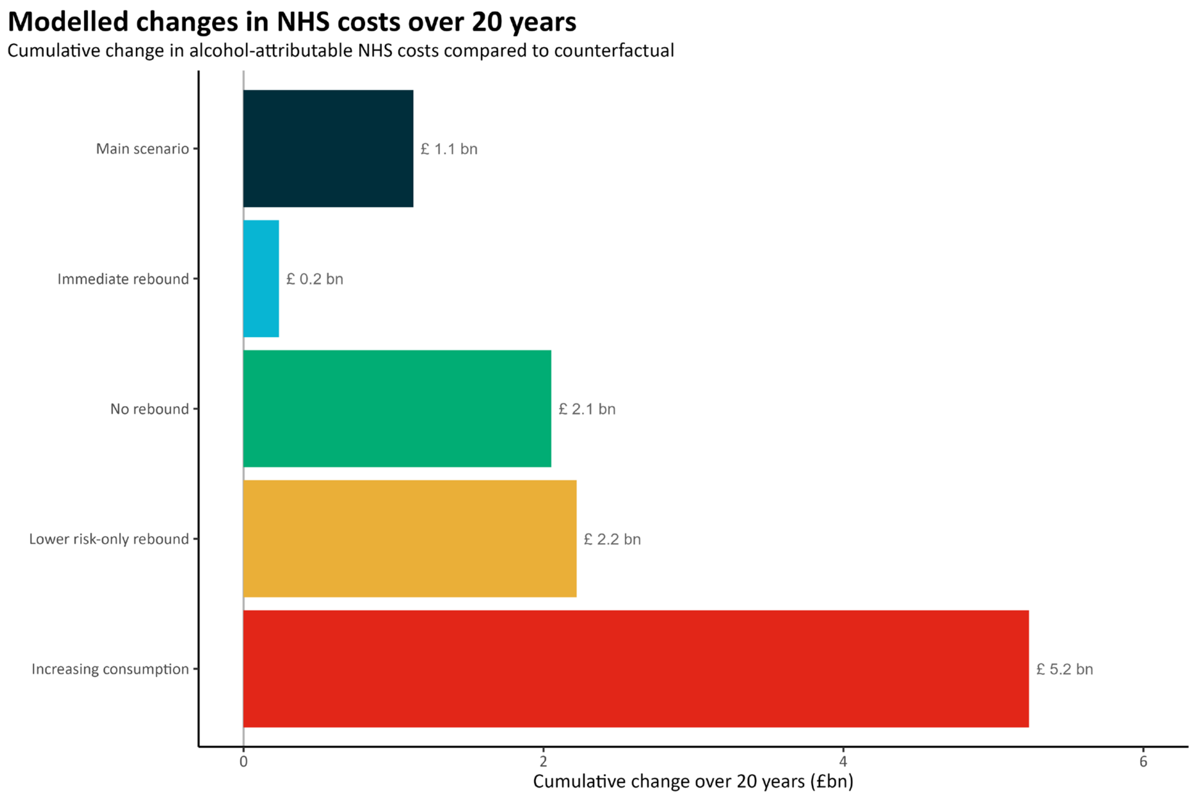
Another way of looking at the inequality impacts of each scenario is to consider the Slope Index of Inequality (SII) and the Relative Index of Inequality (RII)[23]. Broadly speaking, the SII is an absolute measure of inequality based on the absolute difference between the highest and lowest values across the socioeconomic spectrum. The RII is a relative measure based on the ratio of these highest and lowest values. Both SII and RII estimates for the cumulative numbers of hospital admissions and deaths over the 20 year modelled period for both counterfactual and the five scenarios are shown in Table 11. These tell a similar story, with all scenarios seeing an increase in absolute inequality, measured by the SII, but a reduction in inequality, measured by the RII for alcohol-attributable deaths. Changes in the RII for alcohol-attributable hospital admissions are small for all modelled scenarios.

Table 11 - Modelled changes in SII and RII for alcohol-attributable hospital admissions and deaths under each scenario

	Slope Index of Inequality (SII)			Relative Index of Inequality (RII)		
	Scenario	Counterfactual	Difference	Scenario	Counterfactual	Difference
Admissions						
Main scenario	25,355	25,778	423	2.38	2.37	0.00
Immediate rebound	25,355	25,560	205	2.38	2.39	0.01
No rebound	25,355	27,061	1,706	2.38	2.46	0.09
Lower risk-only rebound	25,355	26,067	712	2.38	2.36	−0.01
Increasing consumption	25,355	27,309	1,954	2.38	2.37	−0.01
Deaths						
Main scenario	553	566	14	13.27	10.96	−2.31
Immediate rebound	553	557	4	13.27	12.69	−0.58
No rebound	553	581	28	13.27	10.01	−3.26
Lower risk-only rebound	553	574	21	13.27	9.79	−3.48
Increasing consumption	553	601	48	13.27	7.96	−5.31

Finally, Figure 18 presents the estimated impact of each scenario on cumulative NHS costs associated with alcohol-attributable healthcare provision. Over the 20 year time horizon, we estimate that alcohol will cost the NHS £57.5bn if alcohol consumption remains at 2019 levels. In our main scenario this figure is estimated to rise by 2.0%, an additional £1.1bn in alcohol-related healthcare costs. Under the best-case scenario we estimate that the costs of alcohol to the NHS will increase by 0.4% (£200m), while in the worst-case scenario NHS costs are estimated to increase by 9.1% (£5.2bn) over 20 years.

Figure 18 - Estimated cumulative changes in alcohol-attributable NHS costs



Discussion

Summary of results

Our analyses have shown that alcohol consumption in England has increased since the start of the pandemic and that there is little evidence that this increase has waned since the first lockdown in the spring of 2020. This increase has not been uniform across the population – lower risk drinkers have reduced their drinking, on average, while heavier drinkers are drinking more than they were pre-pandemic. The net impact of these changes in drinking behaviour has been a bigger rise in average alcohol consumption in the middle, and most deprived quintiles of the population during 2020 and 2021.

We subsequently modelled the impact of these changes in drinking behaviour on alcohol-related hospital admissions and deaths, under a range of more or less optimistic scenarios about the persistence of changed drinking patterns in the coming years. Our results have shown that in our main scenario, where alcohol consumption returns immediately to 2019 levels for lower risk drinkers, but rebounds more slowly for heavier drinkers, we estimate to see a total of 207,597 more alcohol-attributable hospital admissions and 7,153 deaths over 20 years compared to a scenario where drinking had remained at 2019 levels. Under the most optimistic scenario, where all alcohol consumption returns to pre-pandemic levels from 2022 onwards, we would expect to see a total of 42,677 additional alcohol-attributable hospital admissions and 1,830 additional alcohol-attributable deaths between 2020 and 2039. Whereas, under our most pessimistic where drinking increases post-pandemic, we estimate an increase of 972,382 additional hospital admissions and 25,192 deaths due to alcohol over the same period.

We estimate that this additional health burden of the pandemic will not be distributed equally across the population. Heavier drinkers and those in the most deprived areas, who already suffer the highest rates of alcohol-attributable harm, are expected to be disproportionately affected. We also anticipate an increase in the cost burden that alcohol places on the NHS of £1.1bn over the next 20 years in our main scenario, with more or less pessimistic estimates ranging from £200m to £5.2bn.

Strengths

The analysis presented in this report represents the most comprehensive estimate to date of both the short- and long-term impacts that recent changes in alcohol consumption associated with the COVID-19 pandemic will have on health in England. The modelling presented here draws on evidence from a wide range of sources and the underlying model, SAPM, has been used extensively, both within the UK and internationally, to address key alcohol policy questions.

Limitations

As with any modelling study, there are a number of limitations to acknowledge and alongside which the results of this analysis should be considered. Many of these have been discussed at length elsewhere (e.g. [13,24,25]), but some are of particular relevance, or are specific to the analysis presented in this report.

Firstly, as discussed earlier in the report, data on changes in drinking behaviour during the pandemic is limited and imperfect. Whilst there have been many surveys, particularly during the initial lockdown, which asked about changes in drinking behaviour, these were generally methodologically weak and of limited value[6]. HMRC data presents a more consistent, reliable source of data, but does not cover England specifically and is subject to bias through alcohol sitting unsold on shop shelves or behind bars, through people buying alcohol but then not drinking it, or through tourist consumption, although this latter factor is likely to have been smaller than usual due to travel restrictions during the pandemic, and has historically represented a relatively small proportion of overall alcohol sales[26]. HMRC data also does not tell us anything about how drinking has changed within individuals.

The vastly different circumstances that we have all faced in the past two years make it likely that many aspects of our behaviour has changed in heterogeneous ways.

The Alcohol Toolkit Study data which we have used to inform the modelling work in this report is more robust than many other sources, being a regular, representative sample which has been collected for several years before the pandemic struck. However it has its own limitations. These include a change in the way the data was collected (from face-to-face to telephone interviews) when the pandemic began in March 2020, although previous analysis have not found any impact of this change[9,10] and the fact that the questions on alcohol consumption (the AUDIT) ask about alcohol consumption “in the past 6 months”, rather than explicitly asking about ‘current’ or ‘recent’ drinking, which may lead the data to understate the scale of short-term changes in drinking.

It is also notable that different sources give different results in relation to the overall magnitude, or even direction of changes in alcohol consumption during the pandemic. HMRC data shows a rise in alcohol clearances and the ATS data also shows an increase in the prevalence of risky drinking. However other sources, have found more limited evidence to suggest that alcohol consumption overall has remained fairly flat, or even fallen[6,27].

There are also many aspects of the epidemiological evidence relating alcohol consumption to risks of harm which remain uncertain. The largest of these is the disputed evidence that lower risk drinking reduces the risk of some cardiovascular health conditions. In SAPM we take this evidence on face value and include these cardioprotective effects in our modelling, in line with other sources[28,29]. However, numerous studies have called the existence of these effects into question (e.g. [30,31]). The impact of this assumption on the findings of the present study are unclear. Removing protective effects would significantly increase our estimate of the *total* burden of alcohol on health, but its impact on the modelling presented here is harder to calculate. In previous sensitivity analyses we have shown that removing protective effects makes relatively little difference to analysis of policy effectiveness[32].

Due to these limitations in the data and evidence base, there can be significant variation in estimates of the total burden of alcohol harm in England, depending on which decisions are made about issues such as cardioprotective effects, or underreporting of alcohol consumption in national surveys[33]. Previous estimates from SAPM are generally conservative compared to other official figures, for example 640,000 alcohol-attributable hospital admissions in 2019 compared to 814,395 as estimated in OHID’s Local Alcohol Profiles for England[34]. As a result, the estimates presented in this report may be conservative compared to those produced using different methodologies.

Finally, the modelling approach used in SAPM cannot fully capture the complexity of the relationship between alcohol consumption and health among those individuals with alcohol dependence. Dependent drinkers are missing or underrepresented from many data sources, including epidemiological studies and it is therefore unlikely that we have fully captured the extent to which the drinking of dependent drinkers may have changed during the pandemic, or the potential health consequences of this. There are also other, critical factors for this population which are beyond the scope of our modelling, including access to specialist alcohol treatment services. Recent data has shown a highly concerning 19.3% increase in alcohol-specific deaths in England in 2020[3]. This rise may, in part, reflect increases in drinking among dependent drinkers, but it may also reflect the consequence of disruption to or unavailability of specialist services during lockdowns as these services moved largely or entirely online. There are also likely to be other COVID-related impacts which may have a major effect on very heavy drinkers, including the health consequences, with COVID having more serious outcomes for those in poorer health, and the wider economic impacts.

As such, the modelling analysis presented here may represent and underestimate of the full impact of the pandemic on alcohol-related health.

Conclusion

In this study we have used the Sheffield Alcohol Policy Model to estimate the short- and long-term health impacts of changes in alcohol consumption during the COVID-19 pandemic, under a series of assumptions about how these changes may be sustained, or otherwise, in the coming years. Our results highlight the substantial impact that increased levels of alcohol consumption among heavier drinkers have already had and that these impacts will continue to be felt for many years, even in the best case scenario. Under more pessimistic assumptions about future drinking behaviour the health burden of pandemic-related changes in drinking is estimated to be substantial, up to a 7.9% increase in alcohol-attributable hospital admissions, a 20.1% increase in alcohol-attributable deaths, and a £5.2bn rise in alcohol-related costs to the NHS over 20 years.

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Appendix

Analysis of HMRC data on alcohol sales

We analysed alcohol clearance data from HMRC to assess the impact of the COVID pandemic on alcohol consumption. This data has several important limitations:

- It is UK-wide, not England-specific
- It represents alcohol on which duty has been paid which has been released onto the UK market, rather than representing actual sales (which in themselves do not necessarily reflect actual consumption)
- It does not include alcohol bought abroad by UK residents
- It includes alcohol bought in the UK by foreign residents
- It does not include domestic production on which duty is not paid (e.g. homebrew beer)

However, it represents the closest thing to objective data on alcohol sales that is available and can still provide useful insights into overall levels of alcohol sold in England.

In the UK, beer and spirits are currently taxed on the basis of their alcohol content, whilst wine and cider are taxed based on the volume of product. HMRC therefore report beer and spirits clearances in terms of total alcohol (i.e. ethanol) but wine and cider clearances in terms of total product. As it is the alcohol content which is associated with health harms, we assume an alcoholic strength of 12.5% for wine and 4.5% for cider, in line with market research data[32].

At the population level, alcohol consumption can be influenced by a wide range of factors, including warm weather and major sporting and cultural events. As these factors can vary from year-to-year, we take a similar approach to that used by the Office for National Statistics when estimating the impact of the pandemic on overall levels of mortality – taking the average of the previous 5 years pre-pandemic as our baseline[35].

Results of this analysis are shown in Figure 19 and Figure 20, demonstrating that clearances were 1.8% higher than the 2015-19 average in 2020 and 4.9% higher in 2021. These figures also illustrate that clearances fell relative to previous years during periods of more severe restrictions, including lockdowns, but then rose to above-average levels when restrictions were relaxed, for example during the late summer of 2020.

Figure 19 - Estimated changes in alcohol clearances in the UK in 2020

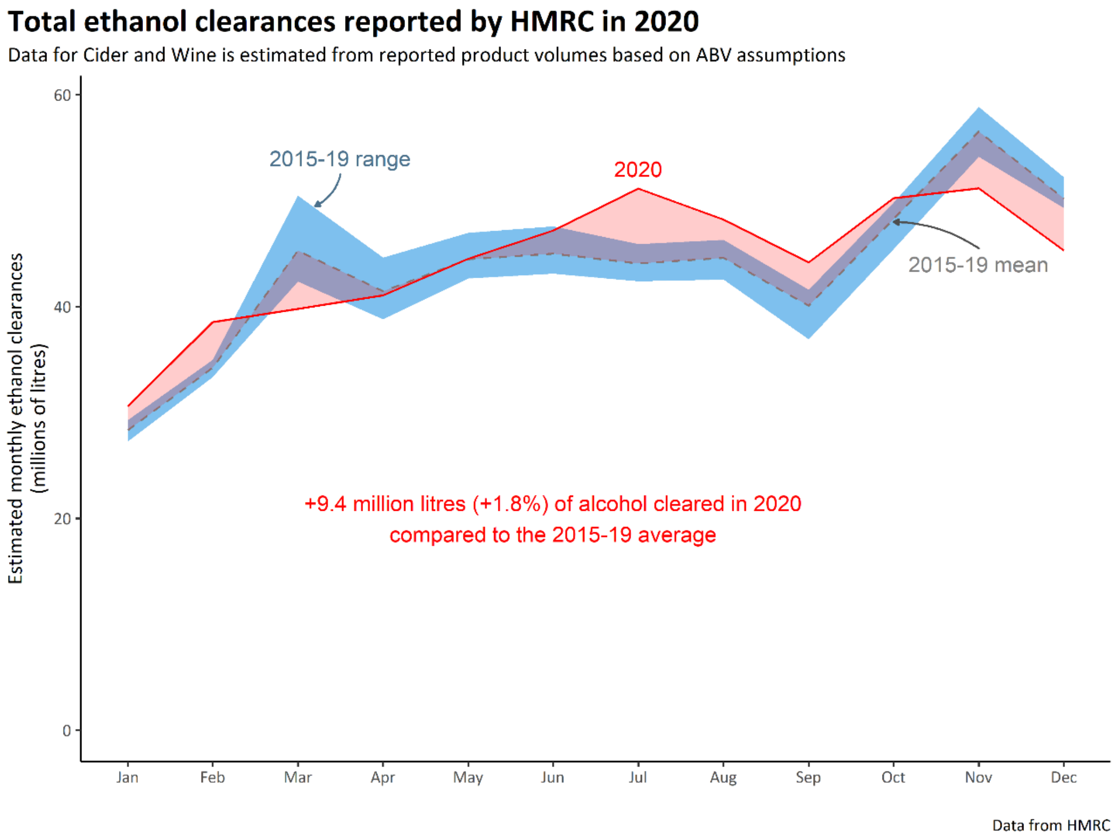
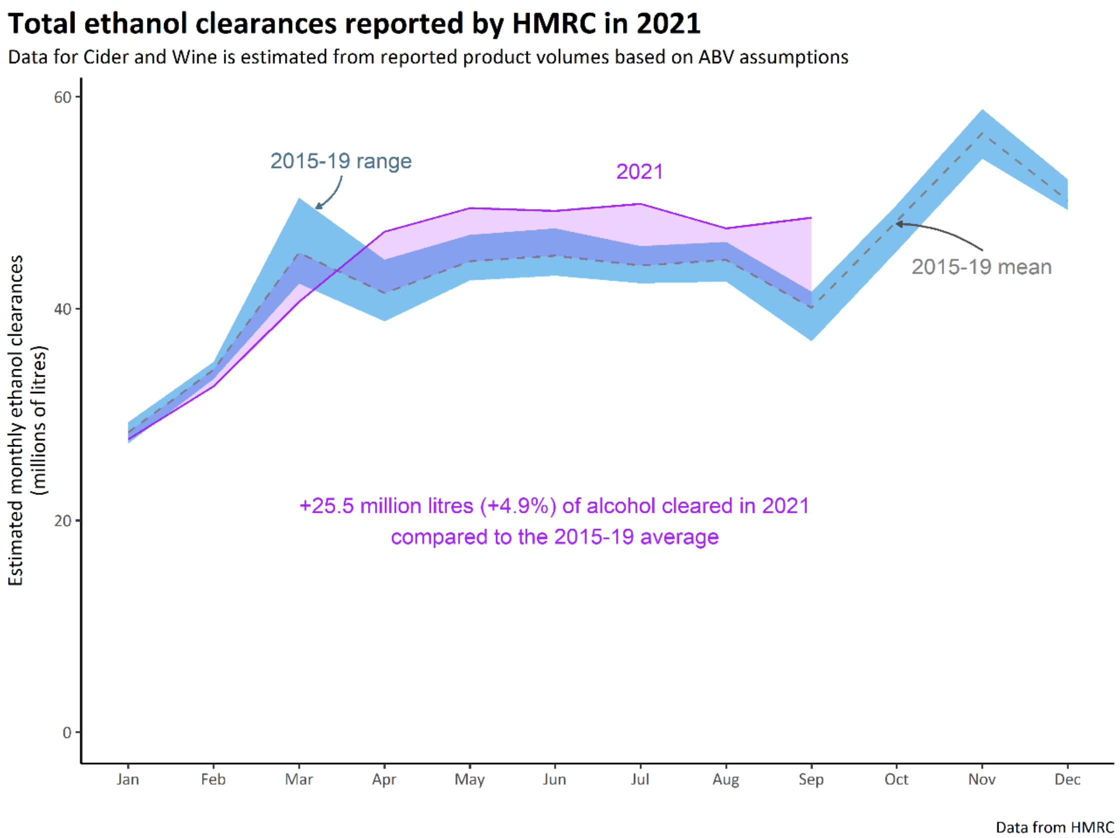


Figure 20 - Estimated changes in alcohol clearances in the UK in 2021



These figures strongly suggest that alcohol consumption is likely to have risen in England during the pandemic. However this increase may not have been equally distributed across the population. We can get a sense of this if we look at the breakdown of changes by drink type, as shown in Figure 21 and Figure 22. These figures show that 2020 saw a large fall in beer clearances – perhaps unsurprisingly since beer is most strongly associated with on-trade drinking – while wine and particularly spirits saw large increases. Beer clearances have rebounded to normal levels in 2021, but spirits and wine clearances have remained at elevated levels compared to 2015-19. Cider clearances have fallen sharply, although cider represents a relatively small proportion of total alcohol sales.

Figure 21 - Estimated changes in alcohol clearances by drink type in 2020

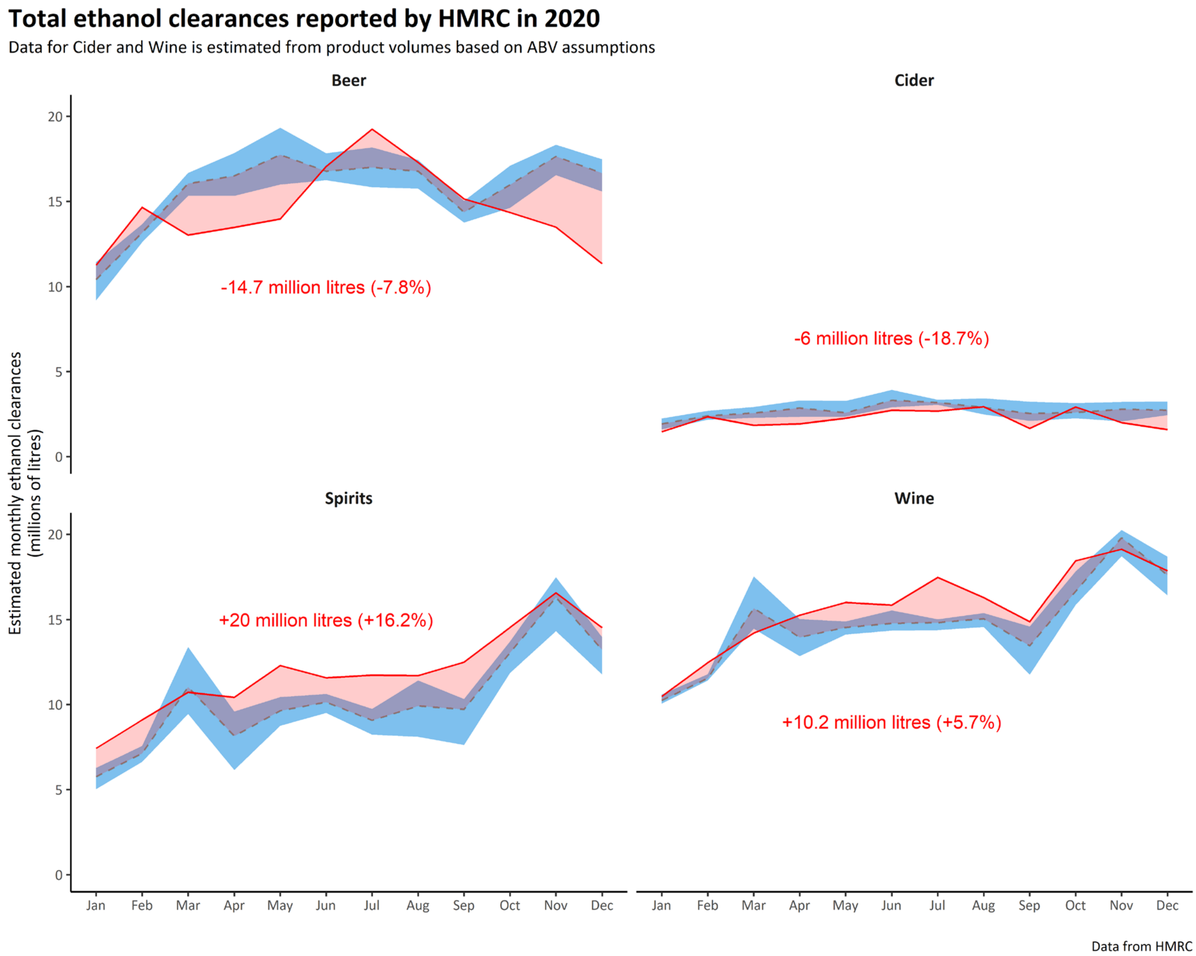
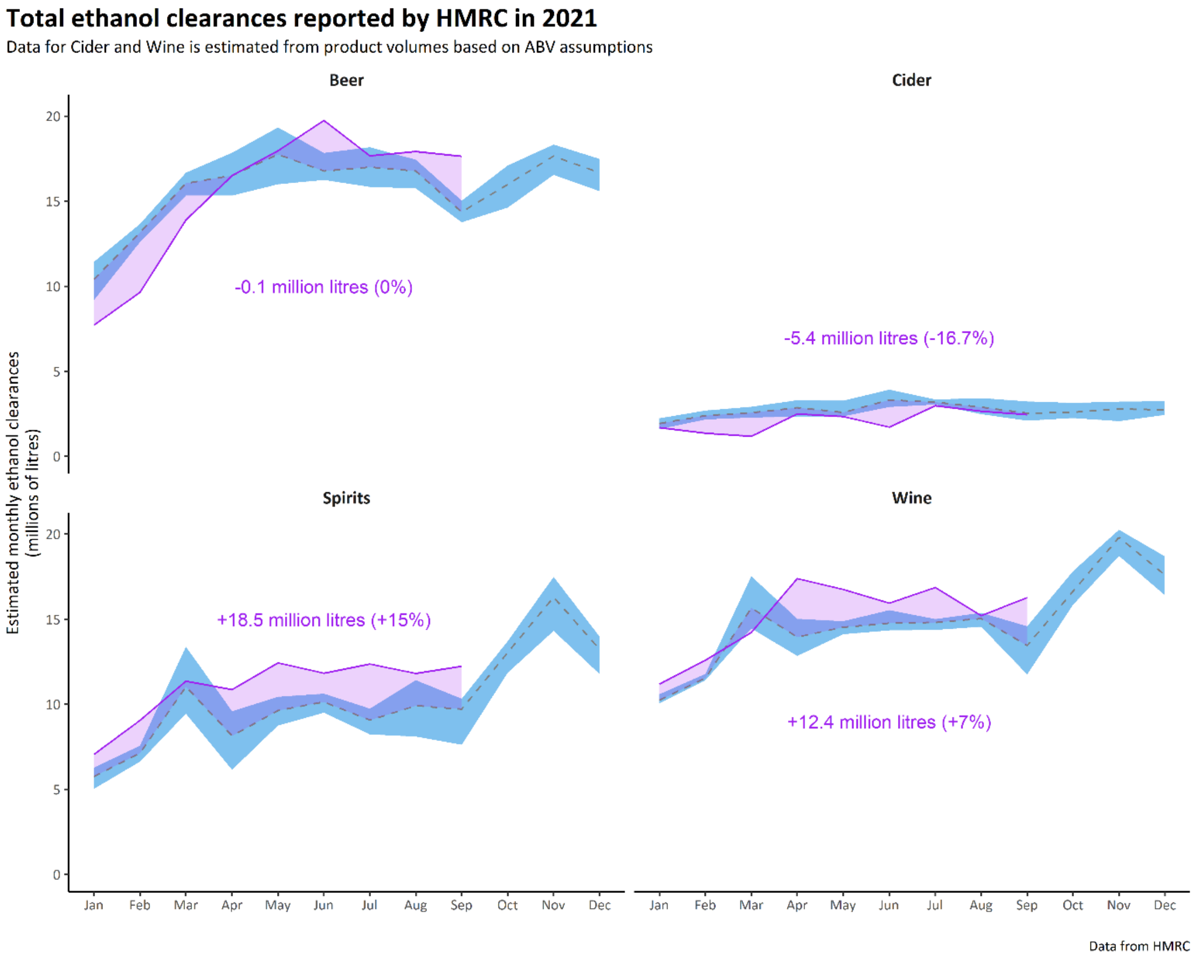


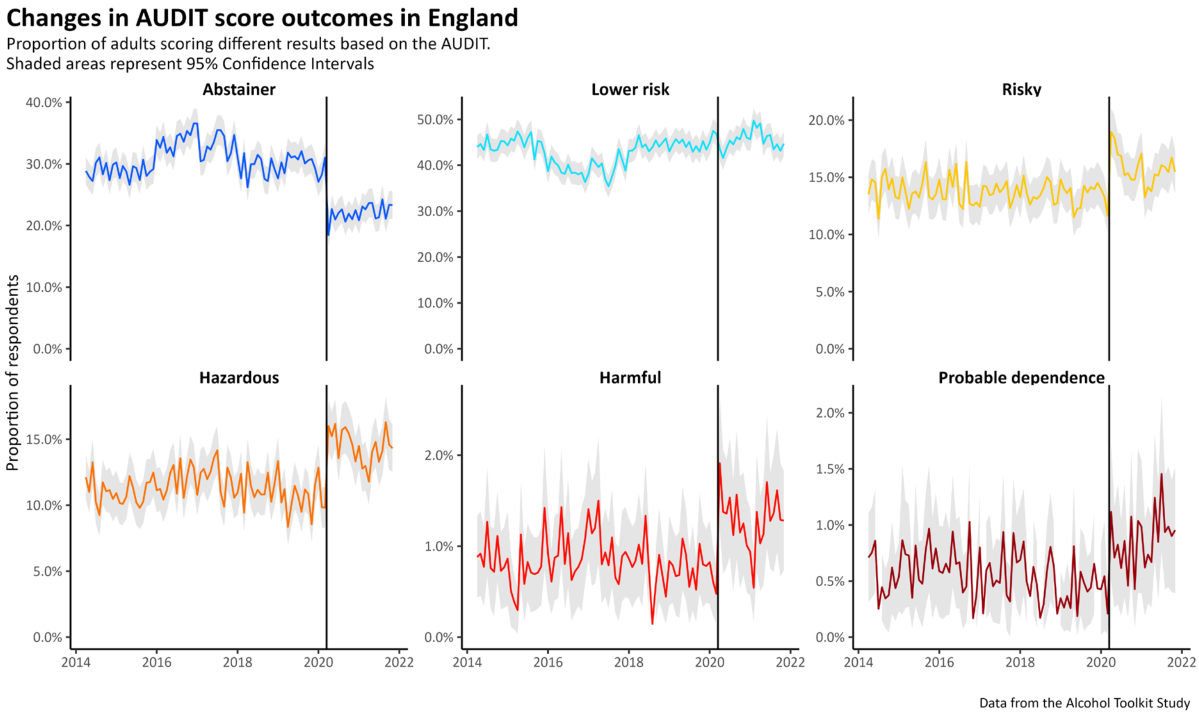
Figure 22 - Estimated changes in alcohol clearances by drink type in 2021



Analysis of changes in alcohol consumption using Alcohol Toolkit Study data

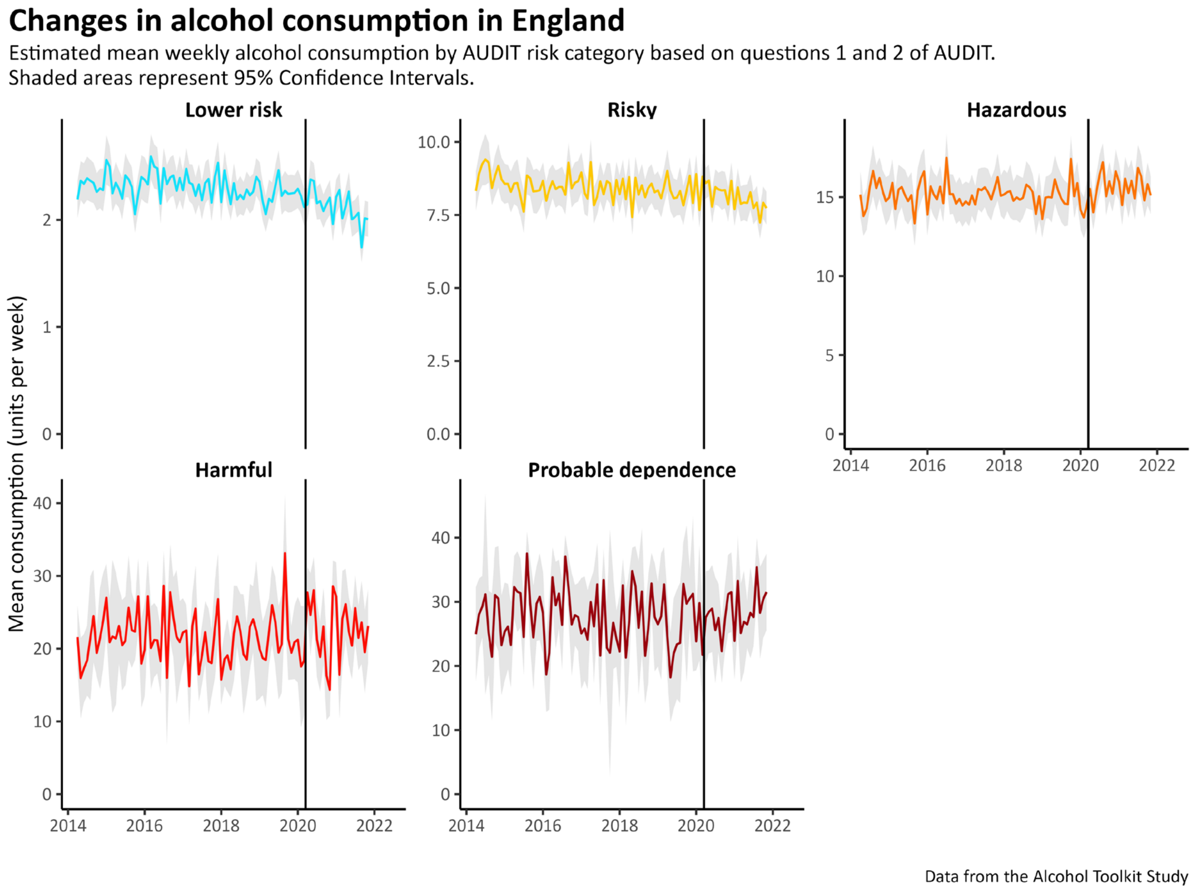
Figure 1 illustrates how levels of both risky and hazardous drinking have increased during the COVID-19 pandemic. In order to understand how drinking levels have changed in more detail we can repeat this analysis using more drinker categories to examine how the proportion of the population who are abstainers, lower risk drinkers (scoring less than 5 on the AUDIT-C), risky drinkers (scoring 5+ on the AUDIT-C but less than 8 on the full AUDIT), hazardous drinkers (scoring 8-15 on the full AUDIT), harmful drinkers (scoring 16-19 on the full AUDIT) and those with probable dependence (scoring 20+ on the full AUDIT). These figures are illustrated in Figure 23, which suggests that there has been a fall in the proportion of adults who do not drink at all, alongside an apparent increase in all risky drinking groups, although the small number of people in the highest risk group means that the increases are not statistically significant.

Figure 23 - Monthly prevalence of self-reported risky drinking in England by drinker group



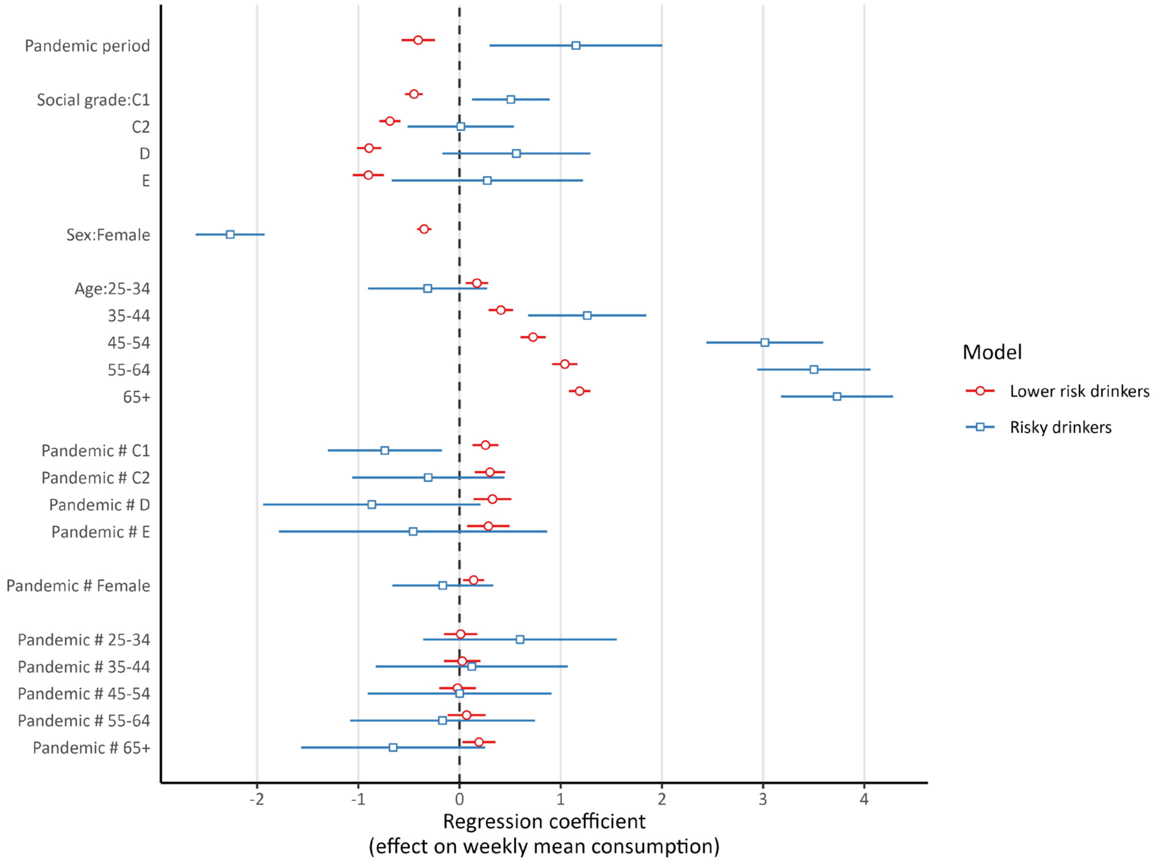
Superficially this fall in abstention appears to be at odds with the apparent polarisation of drinking identified in other studies. However, questions 1 and 2 of AUDIT ask specifically about typical alcohol consumption. If we use these to estimate a mean weekly consumption level, as illustrated in Figure 24, then there is some evidence to suggest that alcohol intake in the lighter drinking groups has indeed fallen during the pandemic period

Figure 24 – Estimated mean weekly alcohol consumption in units by drinker group



Alcohol Toolkit Study regression models

Figure 25 - Summary of regression model outputs showing the association between mean consumption, sociodemographic factors and the pandemic period. Lines represent 95% confidence intervals



Data from the Alcohol Toolkit Study

Table 12 - Regression model coefficients showing the association between mean consumption, sociodemographic factors and the pandemic period.

	Lower risk drinkers			Risky drinkers		
	Coefficient	Std. Error	p-value	Coefficient	Std. Error	p-value
Intercept	2.2419	0.0565	<0.001	10.6672	0.2574	<0.001
Pandemic period	−0.4081	0.0843	<0.001	1.1511	0.4353	0.008
Social grade: C1	−0.4498	0.0452	<0.001	0.5068	0.1959	0.01
C2	−0.6874	0.0531	<0.001	0.0130	0.2677	0.961
D	−0.8940	0.0617	<0.001	0.5621	0.3728	0.132
E	−0.9000	0.0782	<0.001	0.2751	0.4823	0.568
Sex:Female	−0.3497	0.0360	<0.001	−2.2654	0.1738	<0.001
Age:25-34	0.1721	0.0572	0.003	−0.3145	0.3001	0.295
35-44	0.4089	0.0618	<0.001	1.2626	0.2981	<0.001
45-54	0.7263	0.0636	<0.001	3.0171	0.2942	<0.001
55-64	1.0412	0.0636	<0.001	3.5024	0.2860	<0.001
65+	1.1869	0.0541	<0.001	3.7308	0.2820	<0.001
Pandemic # C1	0.2570	0.0652	<0.001	−0.7380	0.2874	0.01
Pandemic # C2	0.3010	0.0766	<0.001	−0.3089	0.3841	0.421
Pandemic # D	0.3258	0.0948	<0.001	−0.8672	0.5482	0.114
Pandemic # E	0.2852	0.1063	0.007	−0.4582	0.6761	0.498
Pandemic # Female	0.1393	0.0529	0.008	−0.1653	0.2543	0.516
Pandemic # 25-34	0.0118	0.0841	0.889	0.5986	0.4879	0.22
Pandemic # 35-44	0.0272	0.0914	0.766	0.1214	0.4844	0.802
Pandemic # 45-54	−0.0196	0.0920	0.831	0.0017	0.4634	0.997
Pandemic # 55-64	0.0706	0.0953	0.459	−0.1679	0.4657	0.719
Pandemic # 65+	0.1930	0.0826	0.019	−0.6561	0.4637	0.157

Detailed model results

Table 13 - Estimated annual changes in alcohol-attributable admissions by condition group compared to counterfactual

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Main scenario																				
Cancer	0	0	−4	−10	−16	−24	−32	−40	−49	−57	−65	146	355	551	747	943	1,139	1,337	1,497	1,617
Cardiovascular	0	492	806	1,372	1,859	2,271	2,611	2,883	2,973	2,897	2,676	2,311	1,687	1,058	546	130	−208	−487	−693	−835
Dependence-related	0	11,057	11,045	11,026	11,001	10,961	10,901	10,825	8,527	6,281	4,085	1,941	−110	−114	−117	−119	−120	−120	−121	−120
Digestive	0	1,015	1,728	2,218	2,604	2,923	3,193	3,427	3,442	3,298	3,037	2,680	2,253	1,948	1,715	1,527	1,370	1,237	1,119	1,013
Injuries (including poisoning)	0	2,004	1,997	1,995	1,976	1,954	1,931	1,906	1,494	1,091	698	313	−65	−68	−70	−72	−73	−75	−76	−77
Other	0	1,262	1,650	2,108	2,274	2,375	2,375	2,368	2,064	1,672	1,229	763	285	88	−21	−77	−102	−109	−114	−117
Immediate rebound																				
Cancer	0	0	−4	−10	−13	−15	−17	−18	−19	−20	−20	197	411	408	405	402	399	396	393	387
Cardiovascular	0	492	806	515	309	162	55	−22	−77	−116	−144	−179	−205	−210	−215	−220	−224	−228	−232	−234
Dependence-related	0	11,057	11,045	−15	−19	−22	−24	−25	−26	−26	−26	−26	−27	−27	−28	−28	−28	−28	−28	−28
Digestive	0	1,015	1,728	1,248	958	773	648	559	492	439	394	356	321	289	261	236	214	195	178	161
Injuries (including poisoning)	0	2,004	1,997	−9	−12	−13	−15	−16	−16	−17	−17	−17	−17	−18	−18	−18	−19	−19	−19	−19
Other	0	1,262	1,650	596	316	160	16	−67	−57	−49	−43	−33	−26	−27	−27	−28	−28	−29	−29	−29
No rebound																				
Cancer	0	0	−4	−10	−17	−25	−34	−44	−54	−64	−74	133	337	539	737	931	1,121	1,309	1,493	1,668
Cardiovascular	0	492	806	995	1,092	1,124	1,107	1,054	977	878	766	632	495	359	223	84	−56	−199	−337	−470
Dependence-related	0	11,057	11,045	11,026	11,001	10,961	10,901	10,825	10,742	10,667	10,600	10,481	10,369	10,263	10,158	10,054	9,950	9,849	9,747	9,636
Digestive	0	1,015	1,728	2,260	2,677	3,020	3,307	3,553	3,770	3,957	4,119	4,250	4,360	4,457	4,538	4,605	4,663	4,712	4,752	4,776
Injuries (including poisoning)	0	2,004	1,997	1,988	1,976	1,960	1,944	1,924	1,903	1,882	1,861	1,837	1,815	1,793	1,771	1,749	1,728	1,710	1,692	1,670
Other	0	1,262	1,650	1,856	1,960	2,003	1,957	1,914	1,873	1,834	1,797	1,761	1,727	1,694	1,660	1,628	1,600	1,574	1,547	1,517
Lower risk-only rebound																				
Cancer	0	0	−4	−10	−16	−24	−32	−40	−49	−58	−67	141	346	537	727	915	1,104	1,294	1,483	1,668
Cardiovascular	0	492	806	1,372	1,859	2,271	2,611	2,883	3,103	3,263	3,367	3,411	3,423	3,281	3,136	2,989	2,848	2,708	2,562	2,401
Dependence-related	0	11,057	11,045	11,026	11,001	10,961	10,901	10,825	10,742	10,667	10,600	10,481	10,369	10,262	10,158	10,054	9,950	9,848	9,747	9,636
Digestive	0	1,015	1,728	2,218	2,604	2,923	3,193	3,427	3,634	3,814	3,971	4,098	4,206	4,301	4,381	4,447	4,505	4,554	4,593	4,617
Injuries (including poisoning)	0	2,004	1,997	1,995	1,976	1,954	1,931	1,906	1,879	1,853	1,830	1,806	1,784	1,762	1,741	1,722	1,701	1,681	1,661	1,640
Other	0	1,262	1,650	2,108	2,274	2,375	2,375	2,368	2,357	2,340	2,321	2,301	2,279	2,248	2,218	2,187	2,158	2,128	2,098	2,065
Increasing consumption																				
Cancer	0	0	−4	−10	−23	−39	−58	−79	−101	−123	−146	48	239	783	1,320	1,849	2,371	2,889	3,399	3,889
Cardiovascular	0	492	806	4,132	6,783	8,896	10,571	11,876	12,903	13,670	14,216	14,570	14,791	14,519	14,218	13,894	13,576	13,268	12,950	12,568
Dependence-related	0	11,057	11,045	23,426	23,387	23,314	23,197	23,043	22,876	22,721	22,578	22,337	22,111	21,895	21,681	21,468	21,256	21,052	20,847	20,618
Digestive	0	1,015	1,728	3,488	4,767	5,753	6,544	7,198	7,757	8,234	8,641	8,975	9,260	9,510	9,718	9,889	10,039	10,165	10,270	10,335
Injuries (including poisoning)	0	2,004	1,997	6,057	6,034	6,002	5,966	5,921	5,872	5,824	5,775	5,724	5,675	5,629	5,580	5,532	5,485	5,443	5,400	5,347
Other	0	1,262	1,650	5,131	5,845	6,218	6,342	6,374	6,273	6,178	6,087	6,003	5,924	5,862	5,798	5,734	5,673	5,616	5,556	5,486

Table 14 - Estimated annual changes in alcohol-attributable deaths by condition group compared to counterfactual

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Main scenario																				
Cancer	0	0	0	−1	−2	−3	−4	−5	−5	−6	−7	8	23	38	53	69	85	101	115	126
Cardiovascular	0	84	146	173	192	205	215	221	219	209	193	168	112	72	43	22	7	−4	−11	−17
Dependence-related	0	33	33	33	33	33	33	32	26	19	12	6	0	0	0	−1	−1	−1	−1	−1
Digestive	0	78	131	169	200	226	248	269	272	264	247	222	192	171	155	142	130	120	111	102
Injuries (including poisoning)	0	43	43	45	45	44	44	43	33	24	15	6	−3	−3	−3	−3	−3	−3	−3	−3
Other	0	21	30	28	28	28	27	27	23	18	13	7	0	−2	−4	−5	−5	−5	−5	−5
Immediate rebound																				
Cancer	0	0	0	−1	−1	−2	−2	−2	−2	−2	−2	14	29	29	29	29	29	29	29	29
Cardiovascular	0	84	146	107	77	55	39	27	18	12	7	0	−5	−5	−5	−5	−5	−5	−5	−5
Dependence-related	0	33	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Digestive	0	78	131	94	73	60	52	46	42	39	36	33	31	28	26	24	22	20	19	17
Injuries (including poisoning)	0	43	43	0	0	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1
Other	0	21	30	12	5	1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1	−1
No rebound																				
Cancer	0	0	0	−1	−2	−3	−4	−5	−6	−7	−8	6	21	36	50	64	79	93	107	121
Cardiovascular	0	84	146	192	226	250	267	279	287	291	293	290	286	282	278	273	269	266	262	257
Dependence-related	0	33	33	33	33	33	33	32	32	32	32	32	31	31	31	30	30	30	29	29
Digestive	0	78	131	171	203	230	253	274	293	310	325	338	350	360	369	377	384	389	394	398
Injuries (including poisoning)	0	43	43	42	42	42	41	41	40	39	39	38	38	37	36	36	35	34	34	33
Other	0	21	30	34	35	35	35	34	33	33	32	31	30	29	28	28	27	26	25	24
Lower risk-only rebound																				
Cancer	0	0	0	−1	−2	−3	−4	−5	−5	−7	−8	7	22	37	51	66	81	97	112	128
Cardiovascular	0	84	146	173	192	205	215	221	225	227	227	223	218	214	210	206	203	200	196	192
Dependence-related	0	33	33	33	33	33	33	32	32	32	32	32	31	31	31	30	30	30	29	29
Digestive	0	78	131	169	200	226	248	269	287	304	319	332	343	354	363	370	377	383	388	391
Injuries (including poisoning)	0	43	43	45	45	44	44	43	42	42	41	40	40	39	38	38	37	37	36	35
Other	0	21	30	28	28	28	27	27	27	26	26	25	24	24	23	22	21	21	20	19
Increasing consumption																				
Cancer	0	0	0	−1	−2	−4	−6	−8	−11	−13	−15	−2	11	53	94	136	177	218	259	299
Cardiovascular	0	84	146	257	336	393	433	460	479	491	496	494	491	484	475	467	459	453	445	436
Dependence-related	0	33	33	72	71	71	71	70	70	70	69	69	68	67	67	66	65	65	64	63
Digestive	0	78	131	264	360	435	495	547	594	634	670	701	729	754	775	794	810	824	836	845
Injuries (including poisoning)	0	43	43	127	127	126	125	124	123	122	121	119	118	117	115	114	113	111	110	108
Other	0	21	30	74	92	99	102	102	101	99	98	96	94	93	91	89	87	86	84	82