Model-based appraisal of Minimum Unit Pricing and Promotion Restrictions for alcohol in Northern Ireland:

An adaptation of the Sheffield Alcohol Policy Model version 4.1

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Executive Summary

Main findings

Estimates from an updated version of the Sheffield Alcohol Policy Model for Northern Ireland suggest that:

- Both Minimum Unit Pricing policies and a ban on price-based promotions, either individually or in combination, would be effective at reducing alcohol consumption and, as a result, lead to fewer alcohol-attributable deaths, hospital admissions, criminal offences and workplace absences.
- Minimum Unit Pricing policies are more effective than promotion bans at targeting the drinking of increasing and higher risk drinkers, as they target only the cheapest alcohol, which is consumed disproportionately by heavier drinkers.
- Rates of alcohol harm are markedly higher among drinkers in poverty. Minimum Unit Pricing policies are estimated to have the largest impact on the alcohol consumption and health of the poorest drinkers, leading to a reduction in existing health inequalities.
- A Minimum Unit Pricing policy would lead to a reduction in government revenue from alcohol taxes, but this would be more than offset by reductions in costs due to alcohol in the NHS, criminal justice system, the economy and wider society. A ban on price-based promotions is estimated to have no net effect on duty revenue, but would also reduce these wider costs.

Research questions

This report was commissioned in May 2022 by the Institute of Public Health to update previous analysis, published in 2014, using the latest available data and the most recent version of the Sheffield Alcohol Policy Model to assess the following questions for Northern Ireland:

- What is the estimated impact of Minimum Unit Price (MUP) policies ranging from 40-80p per unit?
- What is the estimated impact of a ban on price-based promotions in the off-licensed trade (i.e. shops)?
- What is the estimated impact of a combination of MUP and promotion ban policies?
- How do these impacts vary by drinker group (moderate, increasing risk, higher risk) and income group (in poverty, not in poverty)?

Summary of model results

Baseline alcohol consumption, purchasing and harm

- 25% of adults in Northern Ireland do not drink alcohol, 56% drink, but within the UK low risk guidelines, 15% are increasing risk drinkers and 3% are higher risk drinkers. The 19% of the population who drink above the guidelines consume 74% of all alcohol, while the heaviest drinking 3% of the population consume 27% of all alcohol consumed in Northern Ireland.
- Moderate drinkers consume an average of 206 units of alcohol per year compared to 1,266 for increasing risk drinkers and 4,269 for higher risk drinkers. Moderate drinkers spend an average of £285 per year on alcohol compared to £1,128 for increasing risk drinkers and £3,127 for higher risk drinkers.
- A smaller proportion of adults living in poverty do not drink compared to those not in poverty (31% vs. 24%). Those that do drink consume more alcohol on average (624 units per year vs. 577) but spend less (£519 per year vs. £582).

- Moderate drinkers pay an average of £1.39 per unit for alcohol, compared to 89p per unit for increasing risk drinkers and 73p per unit for higher risk drinkers. This difference arises through a combination of heavier drinkers buying a greater proportion of their alcohol in the off-trade, where prices are generally lower, buying more beer and cider, which are cheaper on average than wine and spirits, and paying less for the same type of alcohol, particularly for cider.
- Drinkers in poverty pay less, on average, for their alcohol than drinkers not in poverty, through a combination of these same effects.
- Every year an estimated 448 people in Northern Ireland die as a consequence of their alcohol consumption, representing 3.5% of all deaths. There are also 23,490 hospital admissions due to alcohol, at an annual cost to the NHS of £39.1million.
- Alcohol-attributable deaths and hospital admissions are concentrated in increasing and higher risk drinkers, with 76% of all deaths and 61% of all hospital admissions due to alcohol coming from the heaviest drinking 3% of the population.
- Rates of alcohol-attributable harm are substantially higher among drinkers in poverty, with more than double the rate of alcohol-attributable deaths and admissions as opposed to drinkers who are not in poverty.
- There are an estimated 20,981 criminal offences each year committed due to alcohol at a cost to the police and criminal justice systems and wider society of £326million.
- Each year an estimated 426,000 days of sickness absence are attributable to alcohol, costing the economy £50million.

Modelled effects of pricing policies on alcohol consumption, spending and revenue

- Introducing a 50p MUP in Northern Ireland would be associated with an estimated 3.2% fall in alcohol consumption, equivalent to 18.7 units per year. This effect would be smaller for lower MUP thresholds (e.g. 1.1% for a 40p MUP) and larger for higher thresholds (up to 14.9% for an 80p MUP). For the remainder of this executive summary we will focus largely on 50p MUP, for indicative purposes only. Full results for all MUP thresholds can be found in the report. Banning all off-trade price-based promotions would reduce consumption by an estimated 2.6% and in combination with MUP would be more effective than an MUP alone.
- Reductions in drinking are estimated to be largest among increasing risk (-2.9% for a 50p MUP and -2.1% for a promotion ban) and higher risk (-6.9% for a 50p MUP and -2.7% for a promotion ban) drinkers. This difference is greater for MUP than a promotion ban as MUP more specifically targets the cheapest alcohol that is disproportionately consumed by this group.
- For all modelled MUP policies the reduction in consumption would be greater among drinkers in poverty (-5.0% for a 50p MUP) than those not in poverty (-2.8% for a 50p MUP), while for a promotion ban the reductions would be equal across income groups (-2.6%).
- Under a 50p MUP, 58% of the total reduction in consumption would come among higher risk drinkers and 42% from increasing risk drinkers. For a promotion ban 28% of the reduction would come from higher risk drinkers, 38% from increasing risk drinkers and 34% from moderate drinkers.
- For a 50p MUP, 28% of the total consumption reduction would come from drinkers in poverty, who make up 16.5% of the drinker population, compared to 18% of the reduction in consumption coming from drinkers in poverty under a promotion ban.
- Low MUP levels are estimated to marginally reduce spending on alcohol, while a 50p MUP and above is estimated to increase it (+0.2% for a 50p MUP rising to +2.2% for an

80p MUP). A ban on promotions is associated with a larger increase in consumer spending (+2.7%).

- Under MUP policies, spending is estimated to increase for moderate (+0.5% for a 50p MUP) and increasing risk drinkers (+0.4% for a 50p MUP), while falling for higher risk drinkers (-0.9% for a 50p MUP), with these changes increasing in magnitude at higher MUP thresholds. Under a promotion ban spending is estimated to increase across all drinker groups, with the largest absolute increase in higher risk drinkers (+3.9%).
- Under all modelled policies, spending increases for drinkers not in poverty (+0.3% for a 50p MUP, +2.8% for a promotion ban). Under an MUP spending is estimated to fall for drinkers in poverty (-0.7% for a 50p MUP), while it is estimated to increase for this group under a promotion band (+2.3%).
- Annual revenue to the exchequer is estimated to fall under all MUP policies (-£4.7m for a 50p MUP), but remain at the same level under a promotion ban.
- Revenue to retailers is estimated to increase under all modelled MUP policies, with the largest increases occurring in the off-trade (+£5.8m per year for a 50p MUP compared to +£0.2m for the on-trade). Under a ban on price-based promotions in the off-trade, revenue to off-trade retailers is estimated to increase substantially (+£26.8m) while on-trade revenue is estimated to fall (-£5.5m).

Modelled effects of pricing policies on alcohol-attributable harm

- All modelled policies are estimated to reduce alcohol-attributable mortality in Northern Ireland. A 50p MUP is estimated to reduce annual deaths caused by alcohol by 29 (-6.5%), while a promotion ban would reduce deaths by 20 (-4.5%).
- The reduction in alcohol-attributable deaths is greater in heavier drinkers for all modelled policies. For example, there would be an estimated 25.2 fewer deaths per 100,000 higher risk drinkers under a 50p MUP compared to 8.9 fewer deaths per 100,000 increasing risk drinkers. Equivalent figures for a promotion ban are -4 per 100,000 increasing risk drinkers and -25.9 per 100,000 higher risk drinkers.
- In spite of much higher rates of alcohol-attributable mortality among drinkers in poverty, this group is estimated to see the largest relative fall in deaths under all MUP policies (-7.3% compared to -6.0% for drinkers not in poverty under a 50p MUP). The opposite is true for a promotion ban (-3.1% for drinkers in poverty compared to -5.2% for drinkers not in poverty).
- MUP policies and promotion bans are also effective at reducing alcohol-attributable hospital admissions, with an estimated 1,327 admissions per year (-5.6%) under a 50p MUP and 921 fewer (-3.9%) under a promotion ban.
- The reduction in hospital admissions follows a similar pattern across drinker and income groups to the changes in alcohol-attributable deaths.
- The fall in alcohol-related hospital admissions is estimated to save the NHS in Northern Ireland £2.2million per year under a 50p MUP and £1.5million under a promotion ban.
- A 50p MUP is estimated to reduce alcohol-attributable crimes by 1,222 (-5.8%) per year, with an associated reduction in societal costs of £11m (-5.8%). A ban on promotions is estimated to reduce criminal offences by 770 each year, reducing costs by £7m (-3.7%).
- A 50p MUP is associated with an annual reduction of 21,778 (-5.1%) in the number of workplace absence days lost to alcohol, saving the Northern Irish economy £2.6m (-5.1%). An off-trade promotion ban would lead to 16,519 fewer absence days (-3.9%), saving the economy £1.9m (-3.8%).

Contents

Glossary of terms

Moderate drinker – somebody drinking within the UK Chief Medical Officers' low risk drinking guidelines of 14 units of alcohol per week.

Increasing risk drinker – somebody drinking more than 14 units per week, on average, but no more than 35 units per week for women or 50 units per week for men.

Higher risk drinker – women drinking more than 35 units per week, on average, or men drinking more than 50 units per week.

Minimum Unit Pricing (MUP) – a policy which sets a floor price below which a unit of alcohol cannot be sold.

In poverty – a household whose equivalised household income (i.e. after accounting for the number or people in the household) is less than 60% of the population median.

Ready-To-Drinks (RTDs) – pre-mixed alcoholic drinks such as cans of gin and tonic, alcopops, or wine spritzers.

On-trade – Outlets where alcohol is sold for consumption on the premises, e.g. pubs, bars, restaurants and nightclubs.

Off-trade – Outlets where alcohol is sold for consumption off the premises, e.g. shops or supermarkets.

Introduction

In May 2022 the Institute of Public Health (IPH) commissioned the Sheffield Alcohol Research Group (SARG) to update a previous report undertaken by SARG in 2014 which appraised the potential impact of Minimum Unit Pricing (MUP) for alcohol in Northern Ireland [1]. The previous report used the Sheffield Alcohol Policy Model (SAPM), an alcohol policy appraisal tool which has been widely used to examine the potential impact of alcohol pricing policies including changes to taxation [2,3], MUP policies [4–7], restrictions on availability and marketing [8,9] and the delivery of Screening and Brief Intervention programmes [10,11]. The model has been used to explore the potential impacts of these policies on alcohol consumption, consumer spending, exchequer and retailer revenue, hospital admissions, mortality, healthcare costs, crime, policing and criminal justice costs and workplace productivity, and how these impacts vary across different drinker groups, deprivation levels, geographic regions, age and sex. Versions of SAPM have been developed and adapted for a wide range of countries, including England [2,10,12], Wales [13], Scotland [4], the Republic of Ireland [6], Canada [14] and Italy [15].

The aim of this new project was to adapt the latest version of SAPM (v4.1) to Northern Ireland using the latest available data, to use this new model to produce updated estimates of the impact of a range of MUP policies from 40p per unit up to 80p per unit, both alone and in combination with a ban on promotional discounts. For comparative purposes the report also presents the effects of a 10% price rise on all alcohol products.

Methods

Model overview

The Sheffield Alcohol Policy Model (SAPM) is a deterministic economic and epidemiological policy appraisal tool consisting of a series of interlinked models which can be used to estimate the potential impact of a broad range of alcohol policy options across a wide spectrum of outcomes. Importantly, the model provides many of these outcomes disaggregated across different groups in the population to allow decision makers to assess both the overall impact of policies on population health as well as the distribution impacts of those policies. Detailed methodological descriptions of SAPM are available elsewhere [2,8,16], including the previous Northern Irish report [1].

Briefly, the model operates in the following steps when modelling the impact of a price-based policy (as examined in this report):

First, we model the current (i.e. pre-policy) distribution of alcohol consumption, including preferences for different beverage types, purchased in different locations and at different prices by different groups in the population.

Second, we model how these prices would change under the chosen policy.

Thirdly, we use an econometric model to appraise the impact of these changes in price on alcohol consumption across the population.

Fourthly, we evaluate how these changes in consumption would alter consumer spending, retailer revenue and government revenue through alcohol taxation.

Fifthly, we model the pre-policy scale and distribution of alcohol-related harms (on health, crime and in the workplace).

Sixthly, we appraise how the changes in alcohol consumption arising from the modelled policy alter the level and distribution of alcohol-related harms.

Finally, we assess the economic impact of these changes in harms on healthcare costs, costs to police and the criminal justice system and economic losses through workplace absence.

These steps are put in place through two linked models: one which links policy effects to alcohol consumption and one which links alcohol consumption to harm outcomes. Both of these models are stratified through by sex, age (in 4 groups – 18-24, 25-34, 35-54 and 55+ years old) and income group[1] (those in poverty and those not in poverty). In addition, the model is further disaggregated into 3 drinker groups, defined as:

- Moderate drinkers: those consuming within the UK Chief Medical Officers' low risk drinking guidelines of no more than 14 units of alcohol per week[2]
- Increasing risk drinkers: those exceeding the current guidelines but drinking no more than 35 units per week for women or 50 units per week for men
- Higher risk drinkers: those exceeding 35 units per week for women and 50 units per week for men.

Considering the COVID-19 pandemic

The COVID-19 pandemic, declared by the World Health Organization in March 2020, has had a huge impact on many aspects of people lives, including their health and health-related behaviours, as well as their willingness and ability to engage with healthcare services. Several studies have found that the onset of the pandemic was associated with marked changes in alcohol consumption, with increasing levels of higher risk drinking [18,19], but some evidence of reductions in alcohol consumption among moderate drinkers, suggesting a 'polarisation' of drinking behaviour [20,21]. Subsequent data on alcohol-specific mortality have shown that deaths caused by alcohol reached record levels in Northern Ireland in 2020 [22] and 2021 [23], although these increases were notably smaller than were seen across the rest of the United Kingdom [24]. It is not yet clear to what extent these increases may be a direct result of the changes in alcohol consumption, a consequence of changes in the accessibility of specialist alcohol treatment services during the pandemic, or due to some other factor. Nor is it clear whether the observed changes in drinking behaviour will persist as the pandemic recedes.

In light of these ongoing uncertainties, the challenges of modelling the impact of the pandemic on alcohol consumption, health and healthcare service usage, and the limited amount of data available to date from the pandemic period, the modelling presented in this project uses 2019 as its baseline year. All data used in the model is from 2019, or as close to 2019 as was available, with data from 2020 onwards being excluded. As a result, the modelling presented here does not attempt to incorporate the effects of the pandemic into our analysis. See the Discussion section of the report for further discussion of the implications of this.

Updates since the 2014 report

Whilst the broad structure of SAPM 4.1 remains unchanged from SAPM 3 which was used in the previous Northern Irish report, there have been several developments in the modelling methodology. A number of these, such as new evidence on the extent to which retailers and producers pass increases in alcohol taxation through to consumers and how this varies between product types and across the price spectrum in both the off-trade (shops) [25] and the on-trade (pubs, bars, nightclubs and restaurants) [26], are not directly used in the present

[1] As in the previous report, being in poverty is defined as having an equivalised household income below 60% of the population median. The latest data from 2018/19 shows that 19% of the population of Northern Ireland are in poverty under this definition [17]. As income is not available in all datasets used in this report, where this is not available we have used being in the lowest quintile (i.e. 20%) of the Northern Irish Index of Multiple Deprivation as a proxy for being in poverty.

[2] Note that except where stated otherwise, the 'moderate' drinker group includes non-drinkers

analysis, however, one major development since the 2014 report is a thorough review of the health conditions included in the model and the epidemiological evidence used to link changes in alcohol consumption to changes in health outcomes. The resulting changes include the removal of several health conditions, such as oesophageal varices, cholelithiasis and psoriasis, the inclusion of several other conditions, such as tuberculosis and lower respiratory tract infections, including influenza and new dose-response curves for conditions such as ischaemic heart disease, diabetes (type II) and all modelled cancers – see [27] for full details.

Data

In addition to these methodological changes, the model has been fully updated with new data wherever available to reflect the situation in Northern Ireland in 2019 as accurately as possible. The range of data used in the model and where this has been sourced from is described below.

Population data

Data on the number of adults (aged 18+) living in Northern Ireland by age (in single years), sex and income was obtained from the Northern Ireland Statistics and Research Agency (NISRA).

Alcohol consumption data

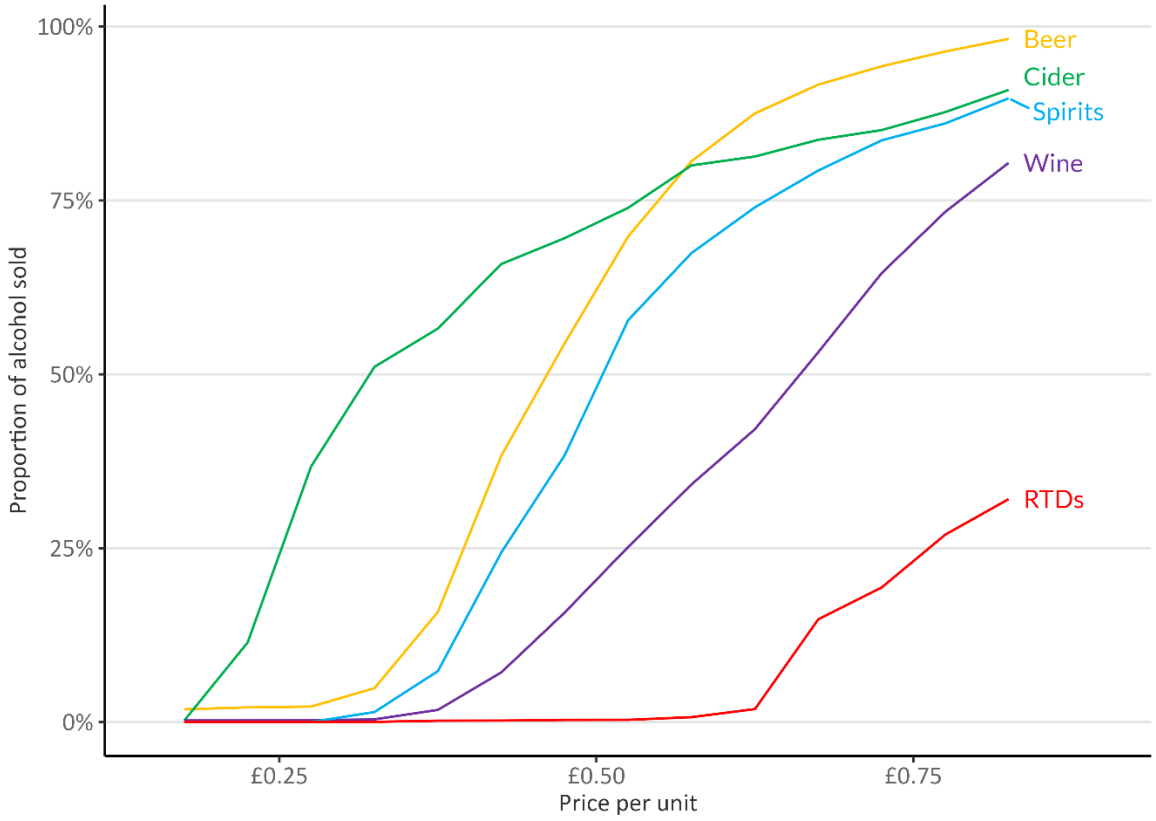
Individual level data on alcohol consumption, split by beer & cider (combined), wine (including fortified wine), spirits and Ready-To-Drinks (RTDs – drinks such as alcopops or pre-mixed spirits with mixers) alongside demographic variables was taken from the 2017/18 and 2019/20 Health Surveys for Northern Ireland, giving us a baseline population sample of 5,241 individuals. In line with previous reports, we use our own assumptions on alcoholic strength and container sizes for different products and as a result the alcohol consumption figures in this report may differ from other published sources.

Alcohol pricing data

Individual transaction-level self-reported alcohol purchasing data for Northern Ireland covering 24,057 separate purchases was obtained from the 2006-2019 Living Costs and Food Survey, provided by the Department for the Environment, Food and Rural Affairs and the Office for National Statistics. This data was inflated to 2019 prices using alcohol-specific inflation indices published by the Office for National Statistics [28].

Off-trade price distributions for Northern Ireland based on aggregated sales data were obtained from market research company NielsenIQ for the purposes of this project. These figures, which give the total volume of alcohol sold in 2019, by beverage type, that was sold in each of 15 price bands from less than 20p/unit, 20-24p/unit, 25-29p/unit etc. up to over 85p/unit. This data was used to calibrate the transaction level data, using the same approach as previous reports [1,8] to ensure that the baseline prices paid in the model aligned with observed sales prices. These price distributions are illustrated in Figure 1, highlighting that the vast majority of cider is sold at low prices, with over half of cider sales taking place below 35p/unit. Beer and spirits are typically more expensive, although 50% of beer is sold for less than 50p/unit and 50% of spirits for less than 55p/unit. Wine is more expensive still, with 50% of wine sales taking place below 70p/unit, while RTDs were the most expensive product in the off-trade, with less than a third of alcohol sold as RTDs being sold for less than 85p/unit.

Figure 1: Empirical price distributions for off-trade alcohol sold in Northern Ireland in 2019 from NielsenIQ



Alcohol price promotion data

In addition to the sales price data illustrated in Figure 1, we also obtained data from NielsenIQ on the proportion of alcohol of each type sold in the off-trade in Northern Ireland in 2019 which was sold on some form of price-based promotion. This data also included information on the RRP of the items on promotion, in order to allow us to estimate the impact of banning price-based promotions. A high-level summary of this data is presented in Table 1, highlighting that a substantial proportion of alcohol sold in shops is sold while on promotion, including the majority of wine sales, with an average discount of between 17.1% on cider and 21.8% on wine.

Table 1: Promotional off-trade alcohol sales in Northern Ireland in 2019 from NielsenIQ

	Proportion sold on promotion	Mean discount on promotional sales
Beer	39.7%	−17.2%
Cider	26.9%	−17.1%
Wine	58.0%	−21.8%
Spirits	47.7%	−19.7%
RTDs	32.4%	−19.6%
Total	47.9%	−20.2%

Price elasticities of demand

Estimates of the relationship between alcohol prices and changes in consumer demand, separated by both channel (on- and off-trade) and beverage type (beer, cider, wine, spirits and RTDs) were taken from previously published estimates [29] as used in the 2014 report.

Mortality data

Condition-specific, and all-cause mortality for 45 different alcohol-related health conditions, split by age, sex and IMD quintile was provided by NISRA for the years 2017-2019. This data was pooled and the 3-year average was used as the baseline in the model, in order to reduce the influence of random year-to-year variation in mortality rates. Table 2 lists the health conditions included in the model (see [27] for further details).

Table 2: Alcohol-related health conditions included in the model

Health Condition	ICD10 code(s)
Oropharyngeal cancer	C00-06, C09-10, C12-14
Oesophageal cancer	C15
Colorectal cancer	C18-20
Cancer of the liver and intrahepatic bile ducts	C22
Pancreatic cancer	C25
Laryngeal cancer	C32
Breast cancer	C50
Hypertensive diseases	I10-14
Ischaemic heart disease	I20-25
Alcoholic cardiomyopathy	I42.6
Cardiac Arrhythmias	I47-49
Haemorrhagic stroke	I60-62
Ischaemic stroke	I63-67
Cirrhosis of the liver (excluding alcoholic liver disease)	K70 (excl. K70.0-70.4, K70.9), K73-74
Alcoholic gastritis	K29.2
Alcoholic liver disease	K70.0-70.4, K70.9
Acute pancreatitis (alcohol induced)	K85.2
Acute pancreatitis	K85 (excl. K85.2, K85.3)
Chronic pancreatitis (alcohol induced)	K86.0
Chronic pancreatitis	K86 (excl. K86.0)
Excessive blood level of alcohol	R78.0
Toxic effect of alcohol	T51.0, T51.1, T51.8, T51.9
Accidental poisoning by exposure to noxious substances	X40-49 (excl. X45), Y10-14, Y16-19, T36-50, T52-65
Alcohol poisoning	X45, X65, Y15
Evidence of alcohol involvement determinted by blood alcohol level	Y90
Transport injuries (including road traffic accidents)	V01-98, Y85.0
Fall injuries	W00-19
Exposure to mechanical forces (including machinery accidents)	W20-52
Drowning	W65-74, Y21
Fire injuries	X00-09, Y26
Other unintentional injuries	W75-99, X10-33, Y20, Y22-25, Y27-29, Y31-34
Intentional self-harm	X60-84 (excl. X65), Y87.0
Assault	X85-Y09, Y87.1
Other intentional injuries	Y35
Diabetes (type II)	E11
Alcohol-induced pseudo-Cushing's syndrome	E24.4
Acute intoxication	F10.0
Mental and behavioural disorders due to use of alcohol	F10.1-10.9
Degeneration	G31.2
Epilepsy and status epilepticus	G40-41
Alcoholic polyneuropathy	G62.1
Alcohol myopathy	G72.1
Maternal care for (suspected) damage to foetus from alcohol	O35.4
Tuberculosis	A15-19
Lower respiratory tract infections	J09-18

Hospital admissions data

Condition-specific hospital admissions data for each of the 45 alcohol-related health conditions, split by age, sex and IMD quintile was provided by the Northern Ireland Department of Health. This data was provided both before and after removing repeat admissions from the same individual, allowing the calculation of the mean number of admissions per year for somebody admitted at least once with each condition. These 'multipliers', which are calculated separately by age and condition, are used to translate between the estimated change in prevalence of each condition and the estimate change in the number of hospital admissions for that condition after a policy has been implemented.

Healthcare costs

Healthcare costs for each condition were adapted from those calculated for Northern Ireland for the previous report, inflated to 2019 prices using a healthcare-specific index of inflation [30].

Relationships between alcohol consumption and risk of health harm

As outlined above, the epidemiological evidence on the relationships between alcohol consumption and harm have been extensively updated since the 2014 report – full details of the evidence used for each health condition in the model can be found in [27]. Note that for several modelled health conditions, most significantly for cardiovascular diseases and diabetes (type II), this evidence suggests that low levels of alcohol consumption are associated with *lower* levels of risk than those faced by non-drinkers. There is significant debate in the scientific community about whether these so-called 'protective effects' of low levels of drinking are genuine, or if they arise due to confounding and limitations in the underlying epidemiological studies [31–34]. Throughout this report, and in line with previous reports, we take these effects on face value as this is the more conservative approach. If these effects are not genuine then the estimates presented in this report of the burden of alcohol on health in Northern Ireland are likely to be a significant underestimate.

Crime volume data

Data on the number of recorded offences, broken down by offence category was obtained for the financial years 2017/18-2019/20 from the Police Service Northern Ireland (PSNI) [35]. This data was averaged across these 3 years to reduce random year-on-year variation. As a substantial proportion of the total number of criminal offences go unreported, multipliers, estimated by the UK Home Office [36], are used to inflate the recorded volumes to estimated total numbers of each offences occurring each year at baseline in Northern Ireland. The resulting estimates are presented in Table 3.

Table 3: Baseline annual recorded and estimated criminal offences by crime category

	Recorded Offences	Multiplier	Estimated Total Offences
Criminal damage			
Criminal damage	18,212	1.1	20,096
Robbery			
Robbery (personal)	482	4.3	2,071
Robbery (business)	133	1.0	133
Sexual offences			
Sexual offences	3,505	12.0	42,180
Theft			
Burglary - residential	4,698	3.6	16,913
Burglary - business & community	1,645	1.0	1,645
Theft from the person	471	5.9	2,779
Theft of a pedal cycle	859	5.9	5,070
Theft from a vehicle	1,741	2.0	3,473
Aggravated vehicle taking	182	0.9	161
Theft of motor vehicle	1,264	0.9	1,118
Shoplifting	6,442	1.0	6,442
Other theft offences	12,290	5.9	72,509
Violent crimes			
Wounding (including actual bodily harm, grievous bodily harm and wounding)	11,772	2.6	30,606
Assault on police (with injury)	648	2.6	1,686
Assault on police (without injury)	2,097	1.5	3,145
Assault without injury	12,509	1.5	18,764
Murder	22	1.0	22

Offender demographics

Beyond overall volumes of crime, by offence category, SAPM also requires estimates of the age and sex breakdown of those offences. In line with previous adaptations of SAPM, this has been done using the age/sex breakdown of convictions for each offence. Data on this breakdown, from 2019, was provided by the Department of Justice.

Costs of crime

Estimates for the cost to society of each offence – including both the direct costs to the police and criminal justice systems as well as a financial valuation of the physical and emotional impacts on the victims of crime – are taken from published estimates from the UK Home Office [36] inflated to 2019 prices using the Consumer Price Index (CPI) [28].

Alcohol-Attributable Fractions for crime

Estimates of the proportion of each offence type which are attributable to alcohol, by age and sex, derived from the Offending and Justice Survey, were taken from the previous report.

Workplace model parameters

Data on the working population, average working days per week, workplace absence rate and the mean gross annual income for each age-sex group were taken from the Northern Irish sample of the quarterly Labour Force Survey from January 2017 – December 2019, totalling 63,245 individual survey responses. The results of this analysis are shown in Table 4. Alcohol-Attributable Fractions, representing the proportion of workplace absences which are caused by alcohol, by age and sex, are taken from the National Alcohol Diary Survey as in the previous report.

Table 4: Estimated workplace model parameters

	Population	Employment rate	Average working days per week	Overall absence rate	Mean gross annual income	Alcohol-Attributable Fraction
Male						
18-24	84,184	59.5%	4.21	0.4%	£34,415	36%
25-34	123,585	87.2%	4.78	0.7%	£25,896	23%
35-54	243,413	83.6%	4.75	0.6%	£35,732	8%
55+	246,459	33.1%	4.50	1.0%	£26,836	10%
Female						
18-24	78,168	62.3%	3.62	0.3%	£12,735	33%
25-34	125,104	76.0%	3.91	1.0%	£22,497	9%
35-54	255,990	75.0%	4.11	1.4%	£24,985	4%
55+	273,342	24.3%	3.85	1.2%	£17,485	0%
Population	1,430,245	59.1%	4.26	1.0%	£25,446	12%

Modelled policies

As an update to the previous 2014 report, our choice of policies to model was drawn primarily from those policies modelled in that report. Due to the effect of inflation eroding the relative value of the lowest modelled MUP threshold in that report – 35p/unit, we replaced this with a new 80p threshold. As a result we modelled 20 different alcohol pricing policies:

- Minimum Unit Price thresholds of 40p, 45p, 50p, 55p, 60p, 65p, 70p, 75p and 80p/unit
- A complete ban on price-based promotions in the off-trade (i.e. no discount of prices below the Recommended Retail Price is permitted)
- The combination of a ban on price-based promotions in the off-trade with each of the listed MUP thresholds
- A 10% price increase in all alcoholic products for comparative purposes.

Sensitivity Analyses

In order to assess the sensitivity of the model estimates to alternative assumptions about the price elasticities included in the model, we have explored the impact on our estimates of the effectiveness of a 50p MUP and a promotion ban (selected as illustrative policies) of using two alternative sources of elasticities. These alternatives are a) estimates from Sousa et al. developed by HMRC [37] and b) new estimates developed by Pryce et al. as part of the SYNTAX project [38] which looked at joint price sensitivity across both alcohol and tobacco products.

Results

Baseline alcohol consumption and harm

Baseline alcohol consumption and purchasing

A summary of baseline alcohol consumption and spending is shown in Table 5. Almost one quarter (24.9%) of adults aged 18+ in Northern Ireland drink no alcohol. On average, those who do drink consume 584 units of alcohol per year – equivalent to roughly 250 pints of beer, 63 bottles of wine or 22 bottles of vodka – at a cost of £572. However, there is substantial variation in those figures. Moderate drinkers, who consume within the UK Chief Medical Officers' low risk drinking guidelines of 14 units per week, make up three quarters (74.8%) of all drinkers and consume an average of 206 units and spend £285 pounds on alcohol per year. Increasing risk drinkers – people who drink over the guidelines but no more than 35 units per week for women or 50 units per week for men – make up just over a fifth of drinkers (21.5%) and drink an average of 1,266 units per year at a cost of £1,128. Higher risk drinkers – men who exceed 50 units per week on average and women who exceed 35 units – make up less than 4% of all drinkers (3.7%) but consume an average of 4,269 units at an annual cost of £3,127.

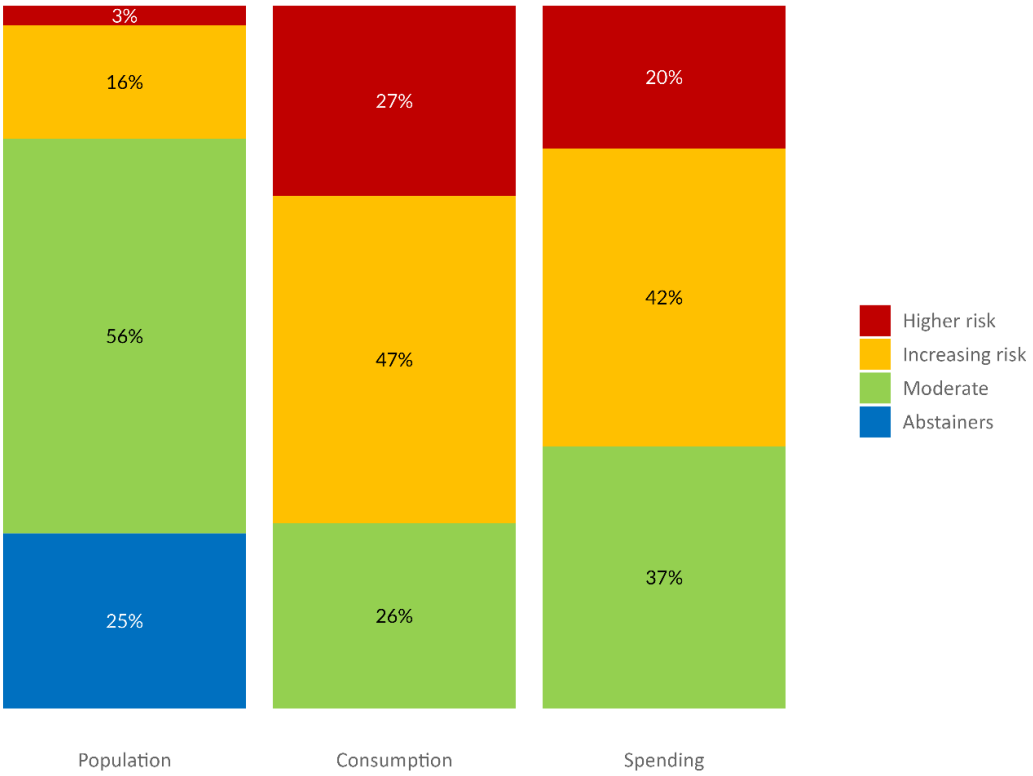
There are also marked differences in drinking behaviour across the poverty line. Among those in poverty, a greater proportion do not drink at all (31.2%) compared to those not in poverty (23.5%), but those who do drink consume more alcohol (624 units/year compared to 577) but spend less (£519 compared to £582).

Table 5: Baseline alcohol consumption and spending

	Abstention Rate	Drinker population	Proportion of all drinkers	Average annual consumption (units)	Average annual spend on alcohol
All Drinkers	24.9%	1,042,201	100.0%	584	£572
Drinker Group					
Moderate	30.7%	779,493	74.8%	206	£285
Increasing Risk	0.0%	224,067	21.5%	1,266	£1,128
Higher Risk	0.0%	38,642	3.7%	4,269	£3,127
Income Group					
In Poverty	31.2%	172,125	16.5%	624	£519
Not In Poverty	23.5%	870,076	83.5%	577	£582

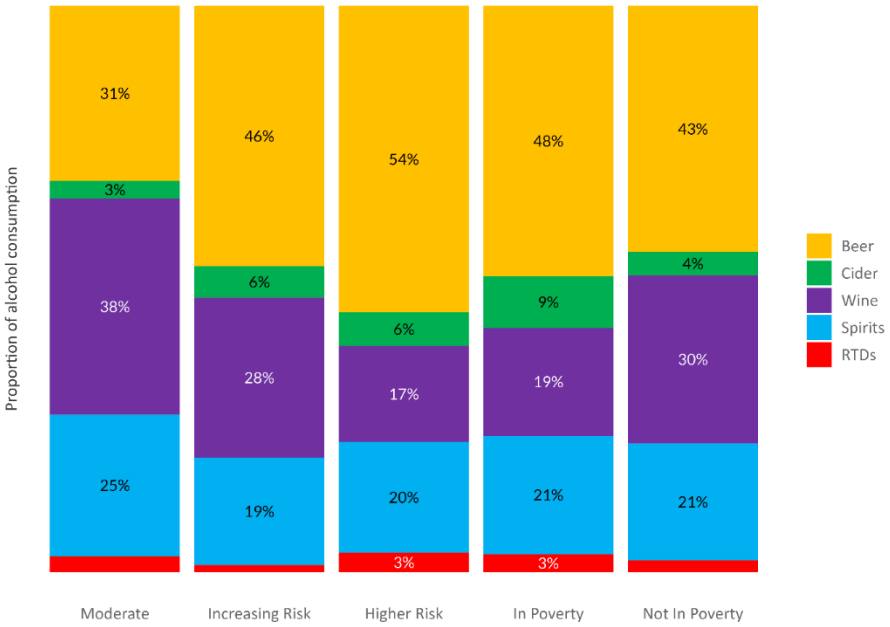
The extent to which heavy alcohol consumption is concentrated in a small proportion of the population is illustrated starkly in Figure 2. This shows that while increasing and higher risk drinkers combined make up 19% of the adult population of Northern Ireland, they drink 74% of all of the alcohol and account for 62% of all money spent on alcohol. More extremely – higher risk drinkers represent 3% of adults, but drink over a quarter of all alcohol consumed (27%) and represent a fifth (20%) of all spending on alcohol.

Figure 2: Distribution of the population, alcohol consumption and spending by drinker type



The extent to which different drinkers are affected by changes in the price of alcohol depends on the types of alcohol they purchase and the locations they purchase it. Figure 3 shows some of this variation by illustrating the proportions of overall alcohol consumption (measures in units of alcohol) which are made up of beer, cider, wine, spirits and RTDs (Ready-To-Drinks - alcopops or pre-mixed spirits with mixers) at baseline. On average heaver drinkers and those in poverty consume more beer and cider and less wine than moderate drinkers and those not in poverty.

Figure 3: Beverage preferences by drinker and income group[3]



Equivalent data on the proportion of alcohol purchased by channel (purchase location – either the on-trade (pubs, bars, nightclubs and restaurants where alcohol is sold for consumption on the premises) or off-trade (shops where alcohol is sold for consumption elsewhere)) – is presented in Figure 4. This shows a clear gradient across drinker groups, with heavier drinker purchasing more of their alcohol in the off-trade. The same is also true of those in poverty compared to those not in poverty, although the difference is smaller.

Figure 4: Drinking location preferences by drinker and income group

[3] Values below 3% not labelled

The differences in average prices paid for alcohol at baseline, split by drinker group, income group, drink type and channel are shown in Table 6. This highlights many patterns that are key to understanding the differential impacts of alcohol pricing policies across the population. Overall, and across all drink types and channels, heavier drinkers buy cheaper alcohol. This is particularly true for cider, for which higher risk drinkers pay an average of 44p/unit compared to 78p/unit for moderate drinkers and spirits, for which higher risk drinkers pay an average of 67p/unit compared to £2.42/unit among moderate drinkers. The picture is similar for drinkers in poverty, compared to those not in poverty.

Table 6: Average (mean) prices paid per unit for alcohol

		Drink type					Channel	
	All	Beer	Cider	Wine	Spirits	RTDs	On-trade	Off-trade
All Drinkers	£0.98	£0.84	£0.60	£0.95	£1.39	£1.23	£1.56	£0.61
Drinker Group								
Moderate	£1.39	£0.94	£0.78	£1.13	£2.42	£1.15	£2.14	£0.66
Increasing Risk	£0.89	£0.85	£0.65	£0.87	£1.05	£1.52	£1.32	£0.63
Higher Risk	£0.73	£0.76	£0.44	£0.75	£0.67	£1.12	£1.15	£0.56
Income Group								
In Poverty	£0.83	£0.80	£0.40	£0.78	£1.14	£0.88	£1.33	£0.56
Not In Poverty	£1.01	£0.85	£0.70	£0.97	£1.44	£1.35	£1.60	£0.63

Baseline alcohol-attributable mortality and hospital admissions

The impacts of alcohol consumption at the levels shown in Table 5 on public health are presented in Table 7. Overall 448 people in Northern Ireland die each year as a result of their alcohol consumption, while there are 23,490 hospital admissions due to alcohol at a cost of £39million to the NHS. As may be expected these harms are far greater among heavier drinkers, with 62 in every 100,000 increasing risk drinkers and 885 in every 100,000 higher risk drinkers dying each year as a consequence of drinking. Hospital admissions rates are also substantial, with 4,637 admissions per 100,000 increasing risk drinkers and 36,803 per higher risk drinker each year. The mean cost per drinker of these alcohol-attributable admissions is £78 per year for increasing risk drinkers and £612 for higher risk drinkers.

Alcohol-related harm is also a clear driver of health inequalities in Northern Ireland, with alcohol-attributable mortality and admissions rates among those in poverty being more than double those not in poverty.

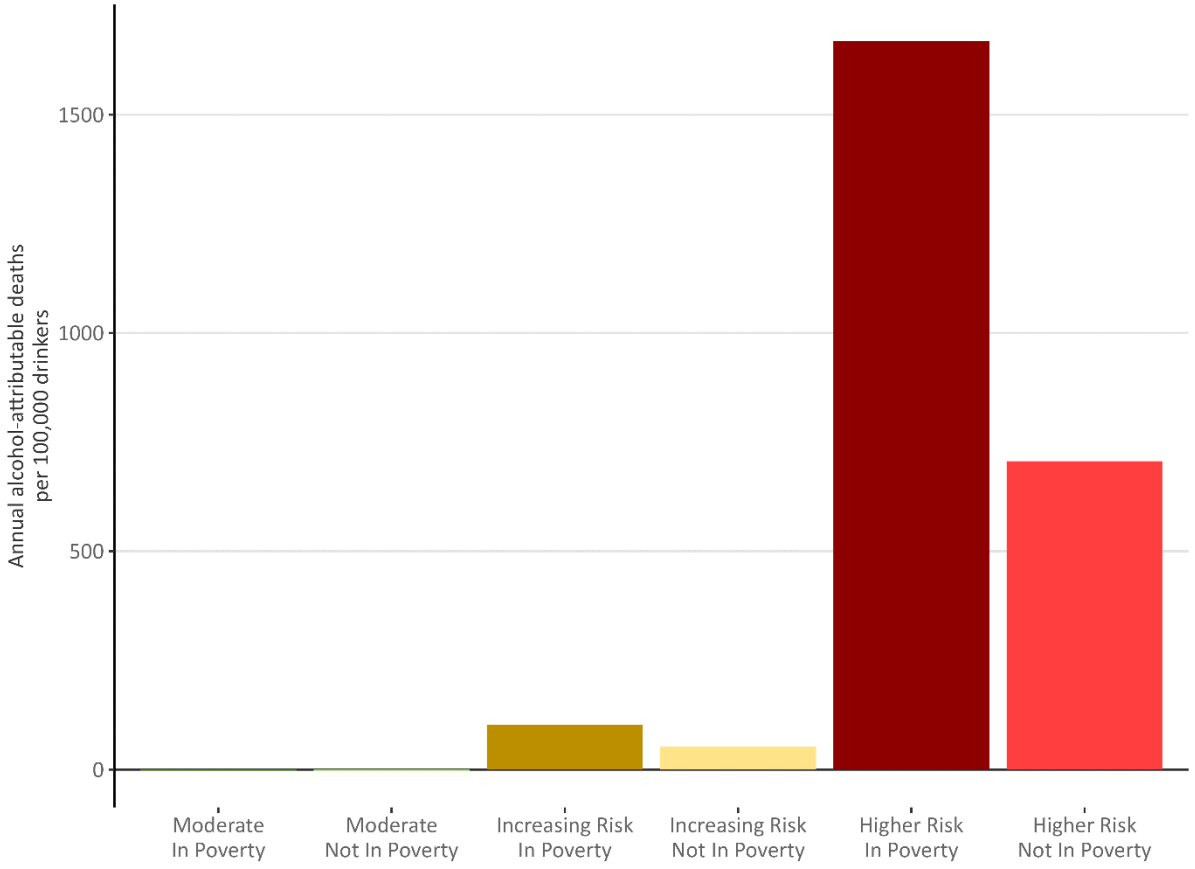
Table 7: Baseline alcohol-attributable health harms

	All Drinkers	Drinker group			Income group	
		Moderate	Increasing Risk	Higher Risk	In Poverty	Not In Poverty
Annual Alcohol-Attributable Deaths						
Deaths	448	−32[1]	138	342	155	294
Deaths per 100,000 drinkers	32	−3[1]	62	885	62	26
Annual Alcohol-Attributable Hospital Admissions						
Admissions	23,490	−1,122[1]	10,390	14,221	7,205	16,285
Admissions per 100,000 drinkers	1,692	−100[1]	4,637	36,803	2,881	1,431
Annual NHS Costs Due To Alcohol (£millions)						
NHS Costs	£39.1	−£2.0[1]	£17.4	£23.7	£11.8	£27.3
NHS Costs per 100,000 drinkers	£2.8	−£0.2[1]	£7.8	£61.2	£4.7	£2.4

[1] Note that negative numbers reflect the fact that in SAPM alcohol consumption in moderate drinkers is estimated to be overall protective, i.e. there are fewer deaths and hospital admissions than if nobody drank. This arises from conservative assumptions in the model, although the evidence remains uncertain whether the effect is genuine. See the discussion section for further details

Figure 5 illustrates how drinking level and income combine in relation to alcohol-attributable deaths. Not only is alcohol-attributable mortality much higher in heavier drinkers, but across all drinkers groups, drinkers in poverty experience much greater rates of harm.

Figure 5: Baseline deaths attributable to alcohol by drinker and income group



Alcohol's impacts on health are many and varied, with 45 different health conditions included in the model. Table 8 shows how the overall burden of alcohol-attributable mortality and hospital admissions breaks down across health condition groups. The largest causes of death due to alcohol are liver disease (207 deaths per year) and cancer (143 deaths per year), while the largest contributors to alcohol-attributable hospital admissions are mental and behavioural disorders due to alcohol (essentially conditions associated with alcohol dependence such as alcohol withdrawal) and hypertension. As discussed in the Methods section, figures for cardiovascular disease and diabetes include protective effects of low levels of drinking. These existence of these effects is highly debated among the scientific community and the overall estimated burden of alcohol harm would be substantially higher if they are excluded.

Table 8: Baseline alcohol-attributable health harms by condition

	Annual alcohol-attributable	
	Deaths	Admissions
Wholly alcohol-attributable		
Liver disease	207	2,295
Mental and behavioural disorders due to use of alcohol	77	7,939
Alcohol poisoning	34	2,258
Other wholly alcohol-attributable conditions	19	3,451
Chronic conditions		
Cancers	143	1,532
Hypertension	9	7,802
Stroke	21	27
Other cardiovascular disease	−113	−6,682
Diabetes	−6	−637
Other chronic conditions	30	3,613
Injuries		
Road traffic accidents	3	48
Falls	11	226
Other injuries	16	1,617
Total	448	23,490

The proportional contribution of each cause group to overall alcohol-attributable mortality and hospital admissions, excluding those conditions estimated to have a net protective effect, is visualised in Figure 6. This shows that conditions that are solely caused by alcohol, in blue, make up just over half of total harm, with the majority of the remainder due to chronic conditions, in red, and a smaller contribution from injuries, in green.

Figure 6: Baseline breakdown of alcohol-attributable harms by health condition (excluding protective conditions)

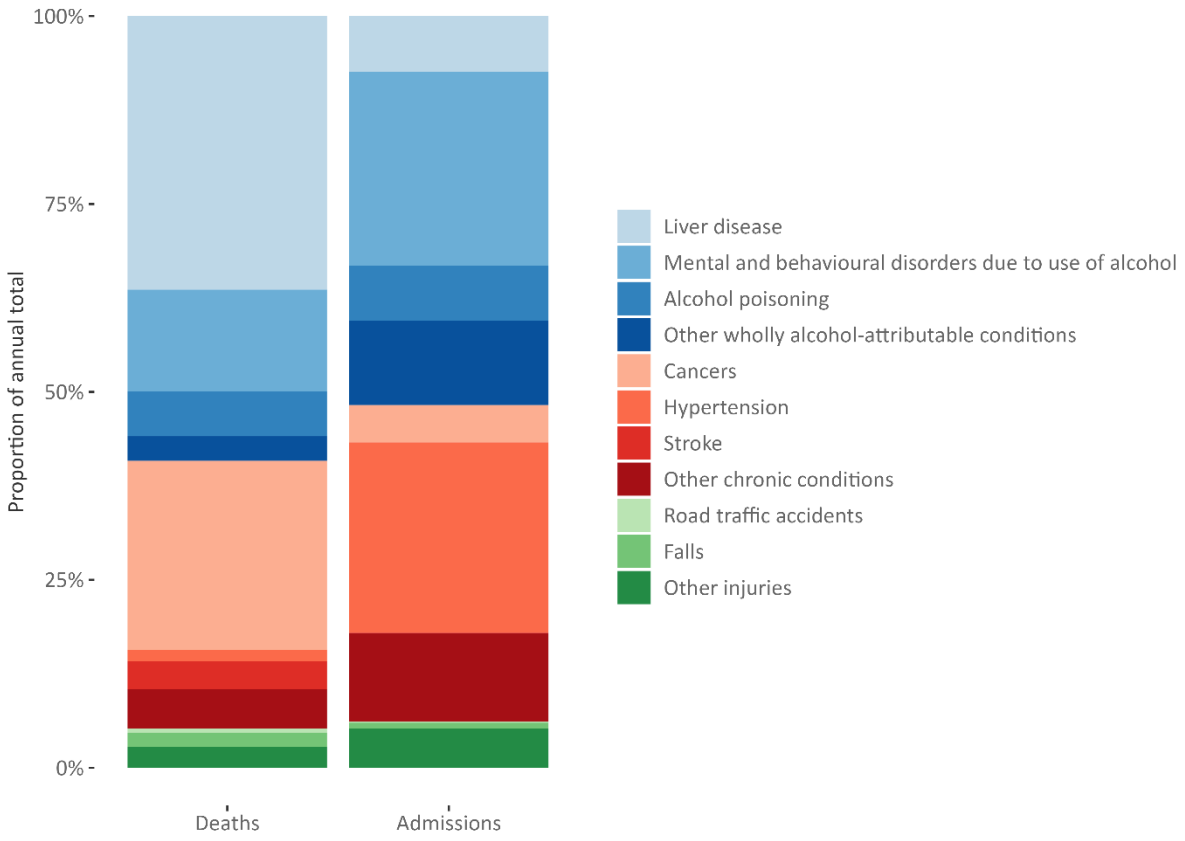


Table 9 shows the extent to which alcohol-attributable deaths contribute to overall mortality in Northern Ireland. An estimated 3.5% of all deaths among adults are a direct consequence of drinking. This number is substantially higher among those in poverty (5.5%) compared to those not in poverty (2.9%).

Table 9: Contribution of alcohol to overall mortality

	Proportion of all deaths which are attributable to alcohol
Population	3.5%
In Poverty	5.5%
Not In Poverty	2.9%

Baseline alcohol-attributable crime

The baseline number of criminal offences estimated to be caused by alcohol, and the associated societal cost, are shown in Table 10 broken down by offence category. Overall there are 20,981 offences annually as a result of alcohol consumption, at a cost of over £325m. The largest offence category is violent crimes such as assault, but alcohol-attributable sexual offences make the largest contribution to the overall cost of alcohol-attributable crime to society due to the large valuation of the physical and emotional harms to the victim.

Table 10: Baseline annual alcohol-attributable crimes by offence category

	Alcohol-attributable offences	Annual cost (£m)
Criminal damage	5,642	£6.9
Robbery	26	£0.3
Sexual offences	6,330	£271.3
Theft	1,730	£2.7
Violent crimes	7,253	£44.5
Total	20,981	£325.6

The estimated breakdown of these alcohol-attributable offences between drinker groups is shown in Table 11, highlighting the much higher rates of alcohol-related offending among heavier drinkers. Note that the differences in these estimated rates are driven only by differences in alcohol consumption, as a lack of data means that we are unable to account for any underlying differences in propensity to commit crimes between drinker groups due to other factors .

Table 11: Baseline annual alcohol-attributable crimes by drinker group

		Drinker Group		
	Population	Moderate	Increasing Risk	Higher Risk
Alcohol-Attributable Offences	20,981	885	11,658	8,438
Rate per 100,000 drinkers	1,511	79	5,203	21,837

Baseline alcohol-attributable workplace absence

The estimated impact of alcohol consumption on workplace absence at baseline is shown in Table 12. We estimate that there are over 426,000 absence days as a direct consequence of alcohol consumption, at a cost of £50.4million to the Northern Irish economy. These rates of alcohol-attributable absence are estimated to be substantially higher among heavier drinkers. Note that these figures only represent the estimated number of absence days based on self-reported attribution of absence to alcohol and therefore exclude absences due to illness caused by alcohol which may be less clearly attributed to drinking directly at the individual level (for example due to cancer) and are therefore highly likely to be an underestimate. They do also not account for the cost of so-called 'presenteeism' where the after-effects of alcohol reduce workplace productivity among those who are at work.

Table 12: Baseline annual alcohol-attributable workplace absences by drinker group

		Drinker Group		
	All Drinkers	Moderate	Increasing Risk	Higher Risk
Alcohol-Attributable Absences (Days)	426,237	27,324	231,904	167,010
Rate per 100,000 drinkers	30,705	2,428	103,498	432,202

Alcohol consumption

The modelled absolute impacts on alcohol consumption (in units per year) for all 20 modelled policies across drinker and income groups is shown in Table 13, with the corresponding relative impacts in Table 14. The differential impacts by drinker groups of each policy are illustrated in Figure 7, with the impacts by income group shown in Figure 8.

Table 13: Modelled absolute policy impacts on alcohol consumption (units/year)

		Drinker group			Income group	
	All Drinkers	Moderate	Increasing Risk	Higher Risk	In Poverty	Not In Poverty
Baseline						
Drinker population	1,042,201	779,493	224,067	38,642	172,125	870,076
Mean consumption (units/drinker/year)	584	206	1,266	4,269	624	577
Policy impact						
10% price rise	−33.2	−8.1	−73.8	−305.0	−40.4	−31.8
40p MUP	−6.3	0.1	−13.4	−94.0	−12.7	−5.1
45p MUP	−11.5	0.2	−23.1	−179.9	−20.6	−9.7
50p MUP	−18.7	0.1	−36.8	−293.2	−31.3	−16.2
55p MUP	−27.5	−0.4	−53.8	−423.5	−45.0	−24.1
60p MUP	−38.1	−1.3	−74.1	−571.7	−62.2	−33.3
65p MUP	−49.4	−2.6	−94.6	−731.4	−81.7	−43.0
70p MUP	−61.1	−4.3	−116.2	−886.7	−100.0	−53.4
75p MUP	−73.5	−6.3	−139.9	−1,042.0	−118.1	−64.6
80p MUP	−86.8	−8.7	−166.1	−1,201.9	−136.5	−77.0
Promotion ban	−15.2	−6.9	−26.8	−113.8	−16.1	−15.0
Promotion ban + 40p MUP	−21.3	−6.9	−40.5	−200.8	−28.1	−20.0
Promotion ban + 45p MUP	−25.7	−6.8	−49.3	−271.1	−35.1	−23.9
Promotion ban + 50p MUP	−32.0	−6.9	−61.5	−368.1	−44.7	−29.5
Promotion ban + 55p MUP	−40.3	−7.2	−78.0	−489.0	−57.4	−36.9
Promotion ban + 60p MUP	−50.4	−7.9	−98.2	−631.6	−73.5	−45.8
Promotion ban + 65p MUP	−61.0	−8.8	−117.6	−784.0	−91.7	−54.9
Promotion ban + 70p MUP	−71.7	−10.1	−138.1	−929.3	−108.5	−64.4
Promotion ban + 75p MUP	−83.0	−11.6	−160.1	−1,076.8	−125.3	−74.6
Promotion ban + 80p MUP	−95.2	−13.4	−183.9	−1,231.8	−142.8	−85.8

Table 14: Modelled relative policy impacts on alcohol consumption

		Drinker group			Income group	
	All Drinkers	Moderate	Increasing Risk	Higher Risk	In Poverty	Not In Poverty
Baseline						
Drinker population	1,042,201	779,493	224,067	38,642	172,125	870,076
Mean consumption (units/drinker/year)	584	206	1,266	4,269	624	577
Policy impact						
10% price rise	−5.7%	−3.9%	−5.8%	−7.1%	−6.5%	−5.5%
40p MUP	−1.1%	0.0%	−1.1%	−2.2%	−2.0%	−0.9%
45p MUP	−2.0%	0.1%	−1.8%	−4.2%	−3.3%	−1.7%
50p MUP	−3.2%	0.1%	−2.9%	−6.9%	−5.0%	−2.8%
55p MUP	−4.7%	−0.2%	−4.3%	−9.9%	−7.2%	−4.2%
60p MUP	−6.5%	−0.6%	−5.9%	−13.4%	−10.0%	−5.8%
65p MUP	−8.5%	−1.3%	−7.5%	−17.1%	−13.1%	−7.5%
70p MUP	−10.5%	−2.1%	−9.2%	−20.8%	−16.0%	−9.3%
75p MUP	−12.6%	−3.1%	−11.1%	−24.4%	−18.9%	−11.2%
80p MUP	−14.9%	−4.2%	−13.1%	−28.2%	−21.9%	−13.3%
Promotion ban	−2.6%	−3.4%	−2.1%	−2.7%	−2.6%	−2.6%
Promotion ban + 40p MUP	−3.7%	−3.4%	−3.2%	−4.7%	−4.5%	−3.5%
Promotion ban + 45p MUP	−4.4%	−3.3%	−3.9%	−6.4%	−5.6%	−4.1%
Promotion ban + 50p MUP	−5.5%	−3.3%	−4.9%	−8.6%	−7.2%	−5.1%
Promotion ban + 55p MUP	−6.9%	−3.5%	−6.2%	−11.5%	−9.2%	−6.4%
Promotion ban + 60p MUP	−8.6%	−3.8%	−7.8%	−14.8%	−11.8%	−7.9%
Promotion ban + 65p MUP	−10.4%	−4.3%	−9.3%	−18.4%	−14.7%	−9.5%
Promotion ban + 70p MUP	−12.3%	−4.9%	−10.9%	−21.8%	−17.4%	−11.2%
Promotion ban + 75p MUP	−14.2%	−5.6%	−12.6%	−25.2%	−20.1%	−12.9%
Promotion ban + 80p MUP	−16.3%	−6.5%	−14.5%	−28.9%	−22.9%	−14.9%

Figure 7: Modelled policy impacts on alcohol consumption by drinker group

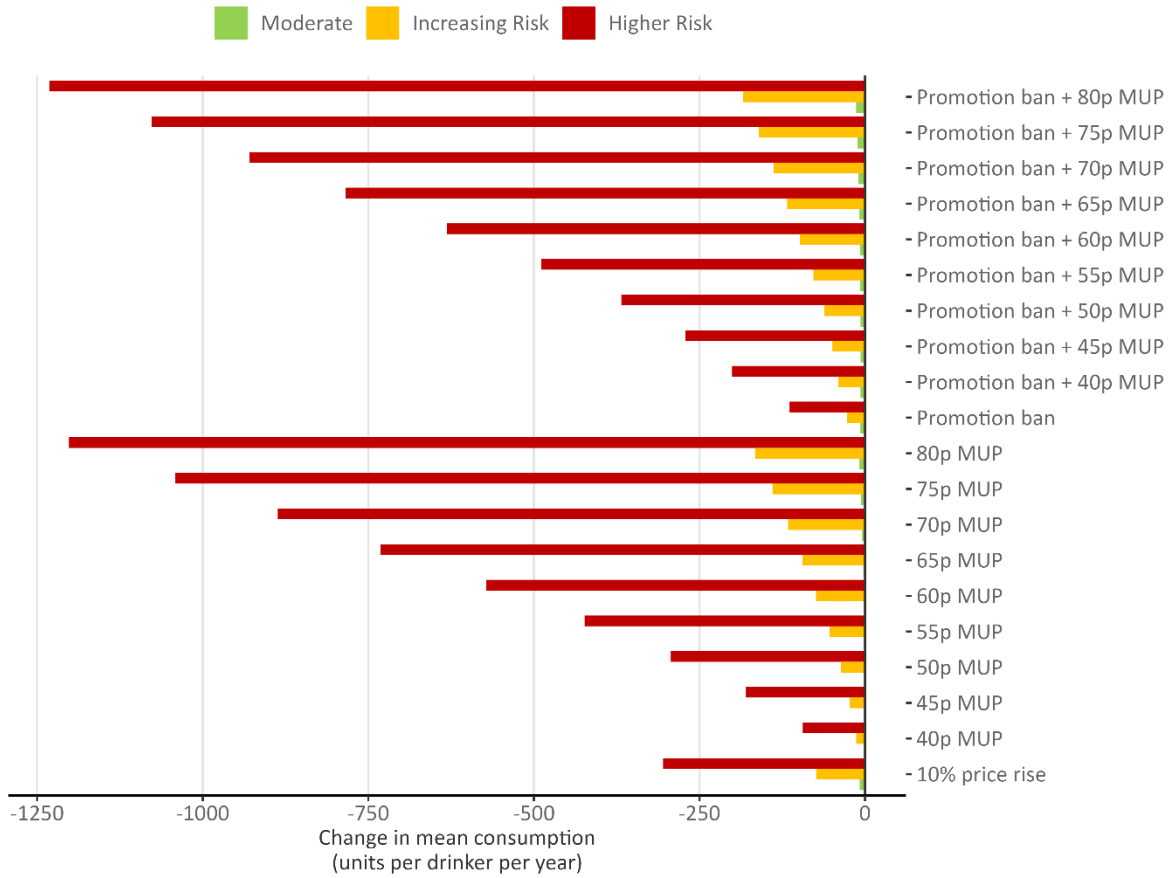
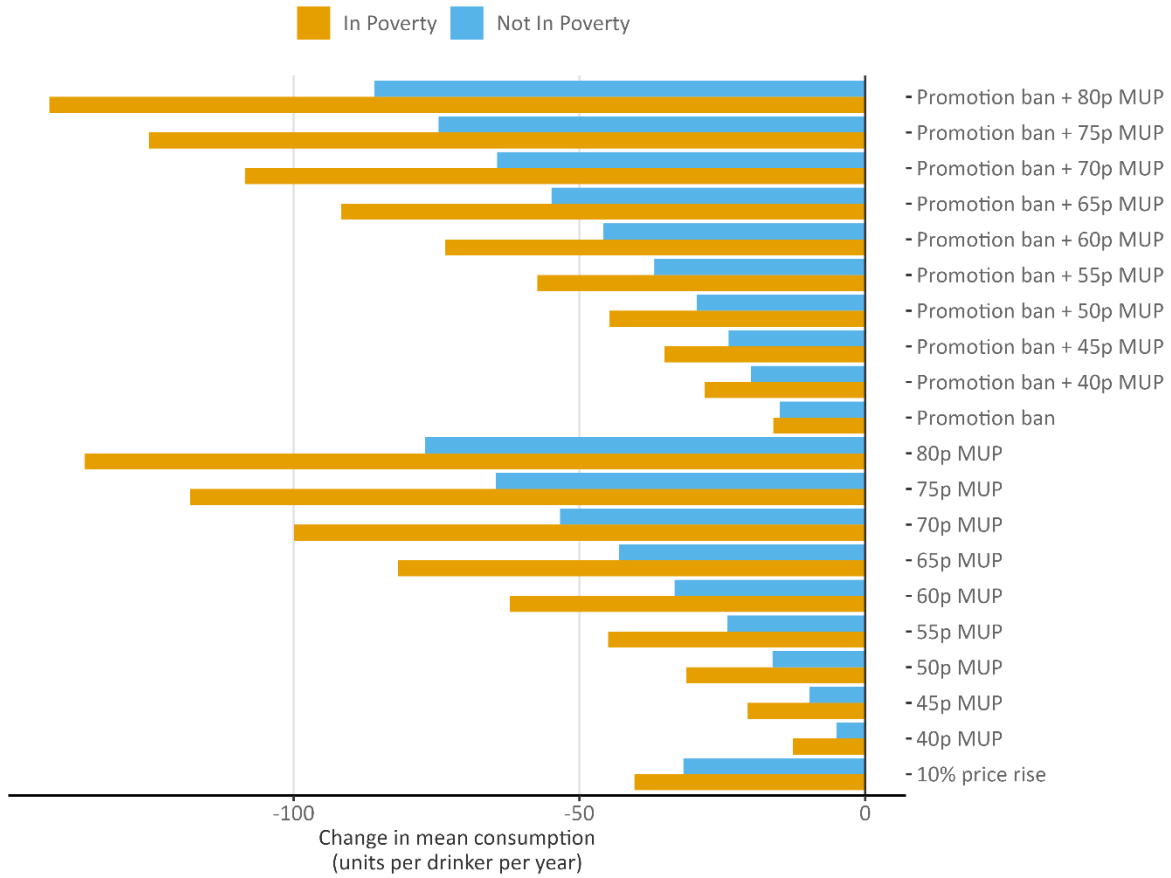


Figure 8: Modelled policy impacts on alcohol consumption by income group

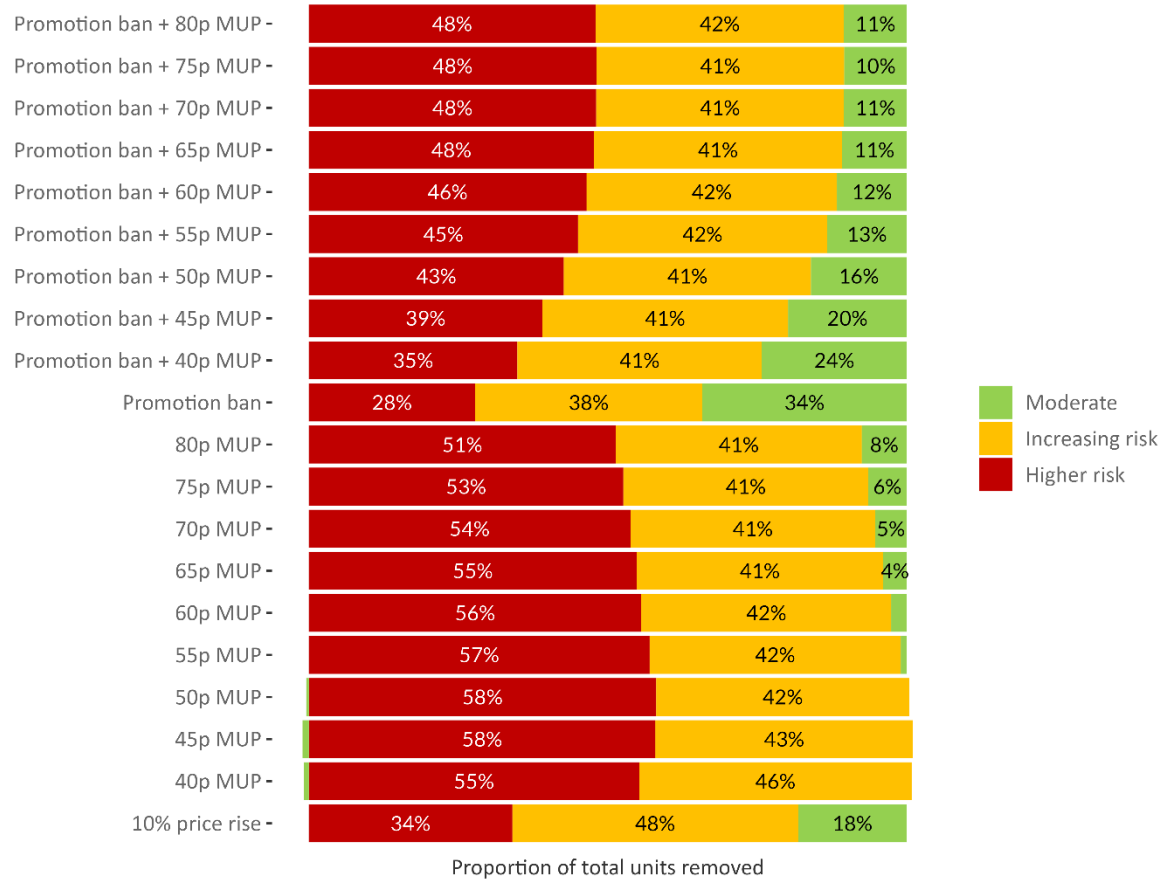


Introducing an MUP is estimated to reduce population alcohol consumption by between 6.3 units per year (-1.1%) for a 40p MUP and 68.8 units per year (-14.9%) for an 80p MUP. A ban on off-trade price-based promotions is estimated to reduce consumption by 15.2 units/year (-2.6%), a marginally smaller reduction than a 50p MUP (-18.7 units or -3.2%). Combining a promotion ban with an MUP is estimated to be more effective than the introduction of MUP alone. However, the distribution of impacts varies between policies as well as their overall magnitude. Below 60p/unit, introducing an MUP would have very little effect on the drinking of moderate drinkers, but a large impact on the heaviest, higher risk, drinkers. As the MUP threshold rises above this level, the policy still has a large impact on the consumption of heavier drinkers, but also an increasing impact on moderate drinkers. This difference occurs because the very cheapest alcohol is bought overwhelmingly by the heaviest drinkers, so lower levels of MUP, which impact on only the lowest prices, affect these groups to a much greater degree than moderate drinkers. As the MUP threshold rises, the proportion of the alcohol market which is affected increases (as can be seen in Figure 1) and so the more drinkers are affected by the policy. Thus higher MUP thresholds are more effective overall, but marginally less targeted at the heaviest drinkers. This shift is illustrated in Figure 9, which shows the proportion of reductions in alcohol consumption under each policy that come from each drinker group.

This figure also illustrate that a ban on promotions is considerably less narrowly targeted at heavier drinkers than any other modelled policy, with over a third of the consumption reductions coming from moderate drinkers. The introduction of an MUP alongside a promotion ban moderates this effect to some extent, with the proportion of consumption reductions coming from moderate drinkers falling as the MUP threshold rises. Overall the combination of MUP and promotion bans is more effective than MUP alone, but this greater

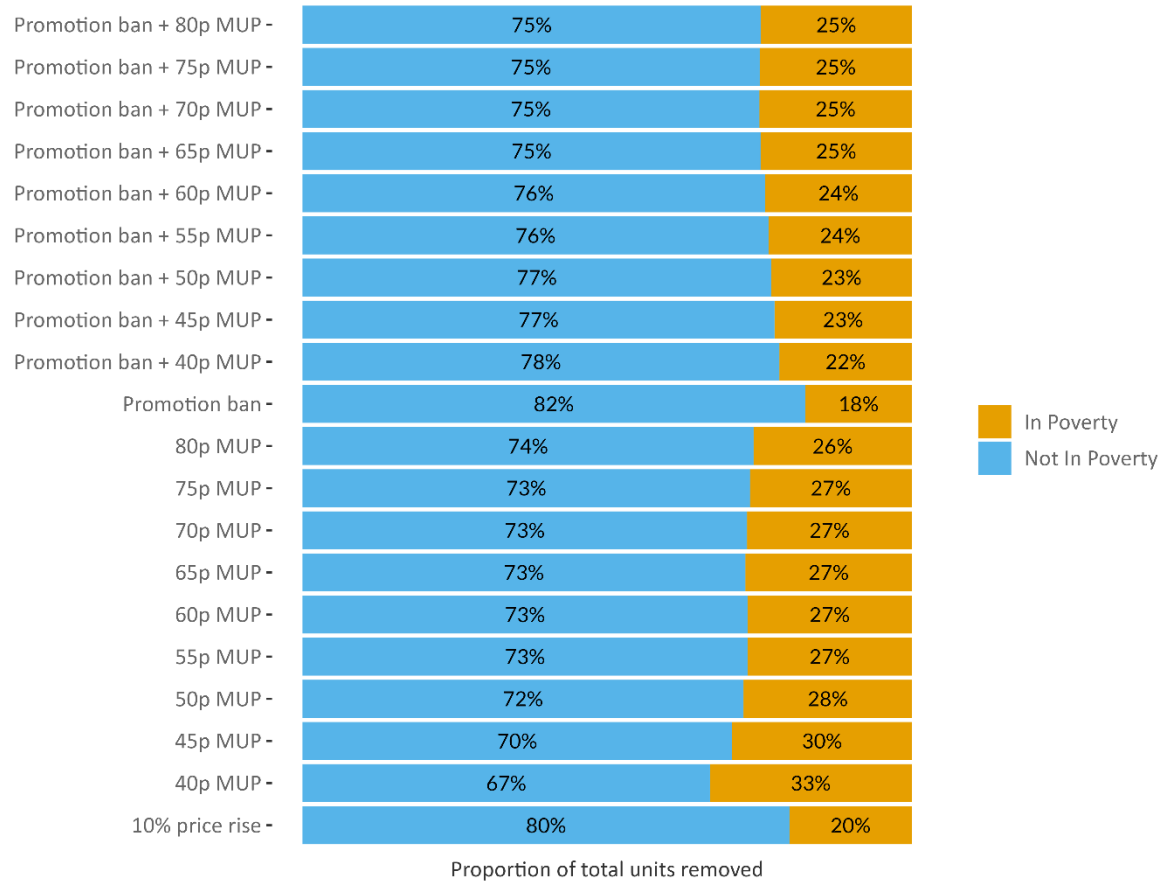
impact on moderate drinkers means that a smaller proportion of the overall reduction in consumption for these combined policies comes from the heaviest, higher risk, drinkers.

Figure 9: Proportion of total reduction in units of alcohol consumed coming from each drinker group under each policy



These results also show that all modelled policies have a larger impact on the alcohol consumption of drinkers in poverty than those not in poverty. This is due to the fact that, as illustrated by Table 6, drinkers in poverty buy cheaper alcohol, on average. For MUP policies alone, the impact on alcohol consumption is estimated to be roughly double, in absolute terms, that on drinkers not in poverty. For example a 50p MUP is estimated to reduce alcohol consumption among drinkers in poverty by 31.3 units/year (-5.0%) compared to 16.2 units/year (2.8%) among drinkers not in poverty. In contrast a ban on promotions has broadly similar impacts on drinker in poverty (-16.1 units/year or -2.6%) and those not in poverty (-15 units/year -2.6%). Combining the two policies leads to a greater impact on the drinking of those in poverty, but not to the same extent as equivalent levels of MUP alone. This is illustrated by Figure 10 which shows that drinkers in poverty, who make up 16.5% of all drinkers, represent a slightly greater proportion of the total consumption reduction from MUP policies alone than MUP policies in combination with a promotion ban.

Figure 10: Proportion of total reduction in units of alcohol consumed coming from each income group under each policy



The estimated impact of all modelled policies on alcohol consumption by both drinker and income group together is shown in Table 15. This shows similar patterns on the more aggregated results, with all policies, but particularly MUP policies, having a greater impact on the drinking of heavier drinkers. It also illustrates that *within all drinker groups* all policies, but particularly MUP, have a greater impact on the drinking of drinkers in poverty.

Table 15: Modelled policy impacts on alcohol consumption by drinker and income group

	Moderate		Increasing Risk		Higher Risk	
	In Poverty	Not In Poverty	In Poverty	Not In Poverty	In Poverty	Not In Poverty
Baseline						
Drinker population	126241	653251	38727	185340	7157	31485
Mean consumption (units/drinker/year)	209	205	1286	1262	4356	4249
Policy impact (relative change)						
10% price rise	-10.2 (-4.9%)	-7.7 (-3.7%)	-86.4 (-6.7%)	-71.2 (-5.6%)	-323.2 (-7.4%)	-300.8 (-7.1%)
40p MUP	-1.3 (-0.6%)	0.3 (0.2%)	-14.9 (-1.2%)	-13 (-1%)	-201.5 (-4.6%)	-69.6 (-1.6%)
45p MUP	-1.8 (-0.8%)	0.5 (0.3%)	-23.7 (-1.8%)	-22.9 (-1.8%)	-334.8 (-7.7%)	-144.7 (-3.4%)
50p MUP	-2.6 (-1.2%)	0.6 (0.3%)	-37.9 (-2.9%)	-36.6 (-2.9%)	-501.2 (-11.5%)	-245.9 (-5.8%)
55p MUP	-4 (-1.9%)	0.3 (0.2%)	-60.4 (-4.7%)	-52.4 (-4.2%)	-684.7 (-15.7%)	-364.1 (-8.6%)
60p MUP	-6.1 (-2.9%)	-0.4 (-0.2%)	-90.7 (-7.1%)	-70.6 (-5.6%)	-897.5 (-20.6%)	-497.7 (-11.7%)
65p MUP	-8.8 (-4.2%)	-1.4 (-0.7%)	-127 (-9.9%)	-87.9 (-7%)	-1123.4 (-25.8%)	-642.3 (-15.1%)
70p MUP	-11.6 (-5.6%)	-2.9 (-1.4%)	-165.7 (-12.9%)	-105.9 (-8.4%)	-1302.3 (-29.9%)	-792.2 (-18.6%)
75p MUP	-14.8 (-7.1%)	-4.7 (-2.3%)	-204.8 (-15.9%)	-126.3 (-10%)	-1471.9 (-33.8%)	-944.2 (-22.2%)
80p MUP	-18.5 (-8.9%)	-6.8 (-3.3%)	-243.6 (-18.9%)	-149.9 (-11.9%)	-1639.3 (-37.6%)	-1102.5 (-25.9%)
Promotion ban	-6.4 (-3.1%)	-7 (-3.4%)	-29.7 (-2.3%)	-26.2 (-2.1%)	-112.9 (-2.6%)	-114.1 (-2.7%)
Promotion ban + 40p MUP	-7.6 (-3.6%)	-6.8 (-3.3%)	-44.6 (-3.5%)	-39.7 (-3.1%)	-300.2 (-6.9%)	-178.2 (-4.2%)
Promotion ban + 45p MUP	-8 (-3.8%)	-6.6 (-3.2%)	-52.4 (-4.1%)	-48.6 (-3.9%)	-421.1 (-9.7%)	-237 (-5.6%)
Promotion ban + 50p MUP	-8.7 (-4.2%)	-6.5 (-3.2%)	-64.4 (-5%)	-60.9 (-4.8%)	-573.3 (-13.2%)	-321.5 (-7.6%)
Promotion ban + 55p MUP	-9.8 (-4.7%)	-6.7 (-3.3%)	-84.5 (-6.6%)	-76.7 (-6.1%)	-749.2 (-17.2%)	-429.9 (-10.1%)
Promotion ban + 60p MUP	-11.5 (-5.5%)	-7.2 (-3.5%)	-112.4 (-8.7%)	-95.2 (-7.5%)	-957 (-22%)	-557.6 (-13.1%)
Promotion ban + 65p MUP	-13.6 (-6.5%)	-7.9 (-3.9%)	-146.1 (-11.4%)	-111.7 (-8.9%)	-1173.4 (-26.9%)	-695.4 (-16.4%)
Promotion ban + 70p MUP	-16 (-7.7%)	-8.9 (-4.4%)	-183 (-14.2%)	-128.7 (-10.2%)	-1337.4 (-30.7%)	-836.5 (-19.7%)
Promotion ban + 75p MUP	-18.7 (-9%)	-10.2 (-5%)	-219.6 (-17.1%)	-147.6 (-11.7%)	-1495.6 (-34.3%)	-981.5 (-23.1%)
Promotion ban + 80p MUP	-21.9 (-10.5%)	-11.8 (-5.7%)	-257.3 (-20%)	-168.6 (-13.4%)	-1655.4 (-38%)	-1135.4 (-26.7%)

Consumer spending on alcohol

The modelled absolute impacts of each policy on consumer spending on alcohol is shown in Table 16, with the relative impacts in Table 17. The impacts by drinker group are illustrated in Figure 11 and impacts by income group are visualised in Figure 12.

Table 16: Modelled absolute policy impacts on consumer spending on alcohol

		Drinker group			Income group	
	All Drinkers	Moderate	Increasing Risk	Higher Risk	In Poverty	Not In Poverty
Baseline						
Drinker population	1,042,201	779,493	224,067	38,642	172,125	870,076
Mean annual spend	£572	£285	£1,128	£3,127	£519	£582
Policy impact						
10% price rise	£31.1	£22.8	£53.0	£72.1	£18.5	£33.6
40p MUP	−£0.4	£0.3	−£0.9	−£11.4	−£2.4	−£0.0
45p MUP	−£0.1	£0.7	£0.4	−£21.3	−£3.2	£0.5
50p MUP	£0.9	£1.4	£4.3	−£28.4	−£3.4	£1.8
55p MUP	£2.8	£2.4	£10.2	−£31.4	−£3.3	£4.1
60p MUP	£5.0	£3.7	£17.7	−£42.0	−£4.0	£6.8
65p MUP	£7.3	£5.3	£26.3	−£63.7	−£6.1	£9.9
70p MUP	£9.6	£7.1	£34.8	−£86.4	−£7.5	£13.0
75p MUP	£11.5	£8.9	£42.6	−£116.0	−£9.3	£15.6
80p MUP	£12.7	£10.7	£49.1	−£158.1	−£12.0	£17.6
Promotion ban	£15.3	£1.3	£45.6	£122.8	£11.8	£16.0
Promotion ban + 40p MUP	£14.7	£1.6	£44.3	£108.1	£9.2	£15.8
Promotion ban + 45p MUP	£14.9	£2.1	£45.2	£97.1	£8.2	£16.2
Promotion ban + 50p MUP	£15.5	£2.7	£47.8	£86.1	£7.5	£17.1
Promotion ban + 55p MUP	£16.0	£3.5	£50.3	£69.1	£6.1	£18.0
Promotion ban + 60p MUP	£16.3	£4.5	£53.0	£42.2	£3.6	£18.9
Promotion ban + 65p MUP	£17.1	£5.8	£57.7	£9.5	£0.3	£20.4
Promotion ban + 70p MUP	£18.0	£7.3	£62.3	−£22.8	−£2.3	£22.0
Promotion ban + 75p MUP	£18.6	£8.8	£66.5	−£61.8	−£5.2	£23.3
Promotion ban + 80p MUP	£18.5	£10.4	£69.3	−£113.5	−£8.8	£23.9

Table 17: Modelled relative policy impacts on consumer spending on alcohol

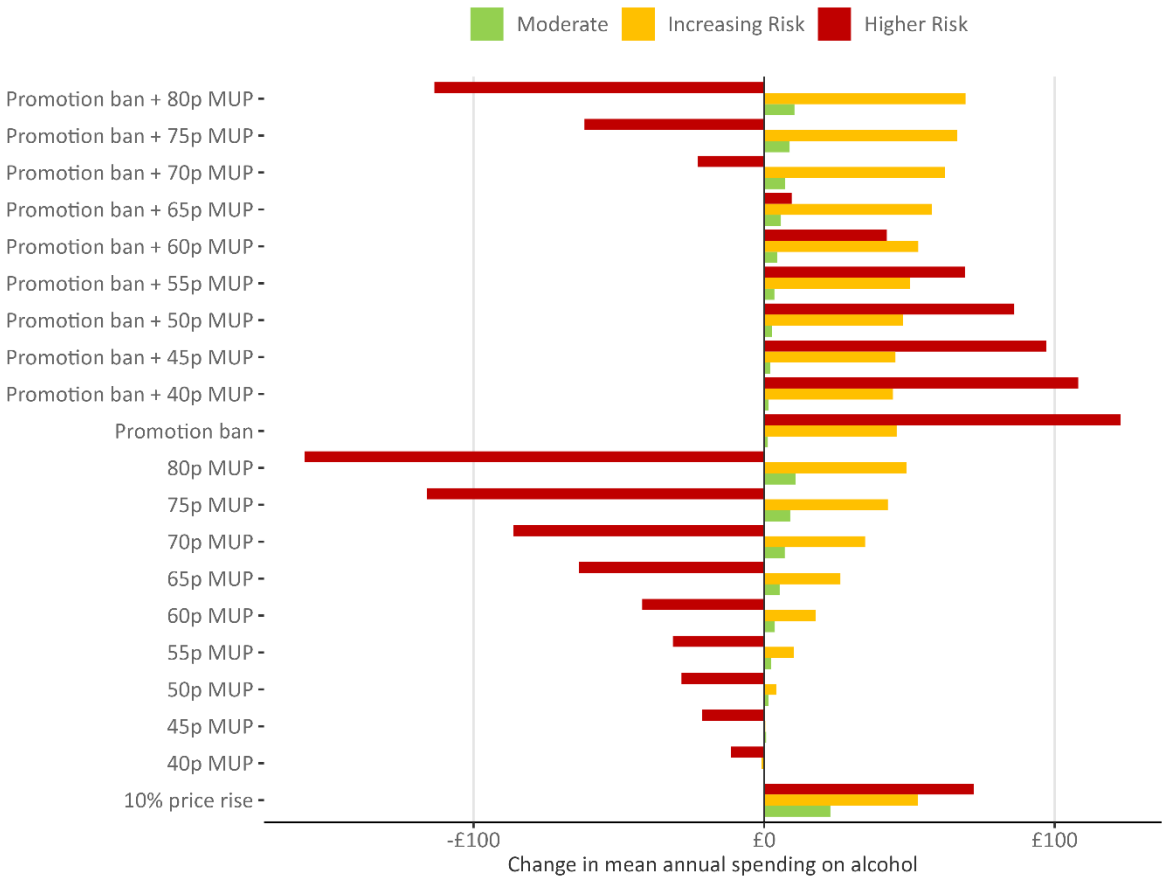
		Drinker group			Income group	
	All Drinkers	Moderate	Increasing Risk	Higher Risk	In Poverty	Not In Poverty
Baseline						
Drinker population	1,042,201	779,493	224,067	38,642	172,125	870,076
Mean annual spend	£572	£285	£1,128	£3,127	£519	£582
Policy impact						
10% price rise	5.4%	8.0%	4.7%	2.3%	3.6%	5.8%
40p MUP	−0.1%	0.1%	−0.1%	−0.4%	−0.5%	−0.0%
45p MUP	−0.0%	0.3%	0.0%	−0.7%	−0.6%	0.1%
50p MUP	0.2%	0.5%	0.4%	−0.9%	−0.7%	0.3%
55p MUP	0.5%	0.8%	0.9%	−1.0%	−0.6%	0.7%
60p MUP	0.9%	1.3%	1.6%	−1.3%	−0.8%	1.2%
65p MUP	1.3%	1.9%	2.3%	−2.0%	−1.2%	1.7%
70p MUP	1.7%	2.5%	3.1%	−2.8%	−1.4%	2.2%
75p MUP	2.0%	3.1%	3.8%	−3.7%	−1.8%	2.7%
80p MUP	2.2%	3.8%	4.3%	−5.1%	−2.3%	3.0%
Promotion ban	2.7%	0.5%	4.0%	3.9%	2.3%	2.8%
Promotion ban + 40p MUP	2.6%	0.6%	3.9%	3.5%	1.8%	2.7%
Promotion ban + 45p MUP	2.6%	0.7%	4.0%	3.1%	1.6%	2.8%
Promotion ban + 50p MUP	2.7%	1.0%	4.2%	2.8%	1.4%	2.9%
Promotion ban + 55p MUP	2.8%	1.2%	4.5%	2.2%	1.2%	3.1%
Promotion ban + 60p MUP	2.9%	1.6%	4.7%	1.4%	0.7%	3.2%
Promotion ban + 65p MUP	3.0%	2.0%	5.1%	0.3%	0.1%	3.5%
Promotion ban + 70p MUP	3.1%	2.5%	5.5%	−0.7%	−0.5%	3.8%
Promotion ban + 75p MUP	3.3%	3.1%	5.9%	−2.0%	−1.0%	4.0%
Promotion ban + 80p MUP	3.2%	3.7%	6.1%	−3.6%	−1.7%	4.1%

These results are more complex than the impacts on alcohol consumption, with spending rising in some groups and under some policies, as reductions in consumption are not sufficient to offset increases in price, while spending falls in other groups under some policies as consumption reductions do offset increased prices. Overall, low MUP levels (below 50p) are estimated to reduce population spending, with higher MUPs increasing spending, although the total effect is small even for the largest MUP (+£12.7 per drinker per year, a 2.2% rise). A promotion ban alone is estimated to have a bigger impact on spending (+£15.3 per drinker per year or +2.7%), and this rises further for MUP thresholds about 50p when combined with a promotion ban.

Breaking this down by drinker group, we can see that MUP policies are estimated to increase spending for moderate and increasing risk drinkers, but reduce spending for higher risk drinkers, with these increases and decreases getting larger in magnitude for higher MUP thresholds. In contrast a ban on off-trade promotions is estimated to increase spending in all groups, with the biggest absolute increase in the heaviest drinkers. When combined with an

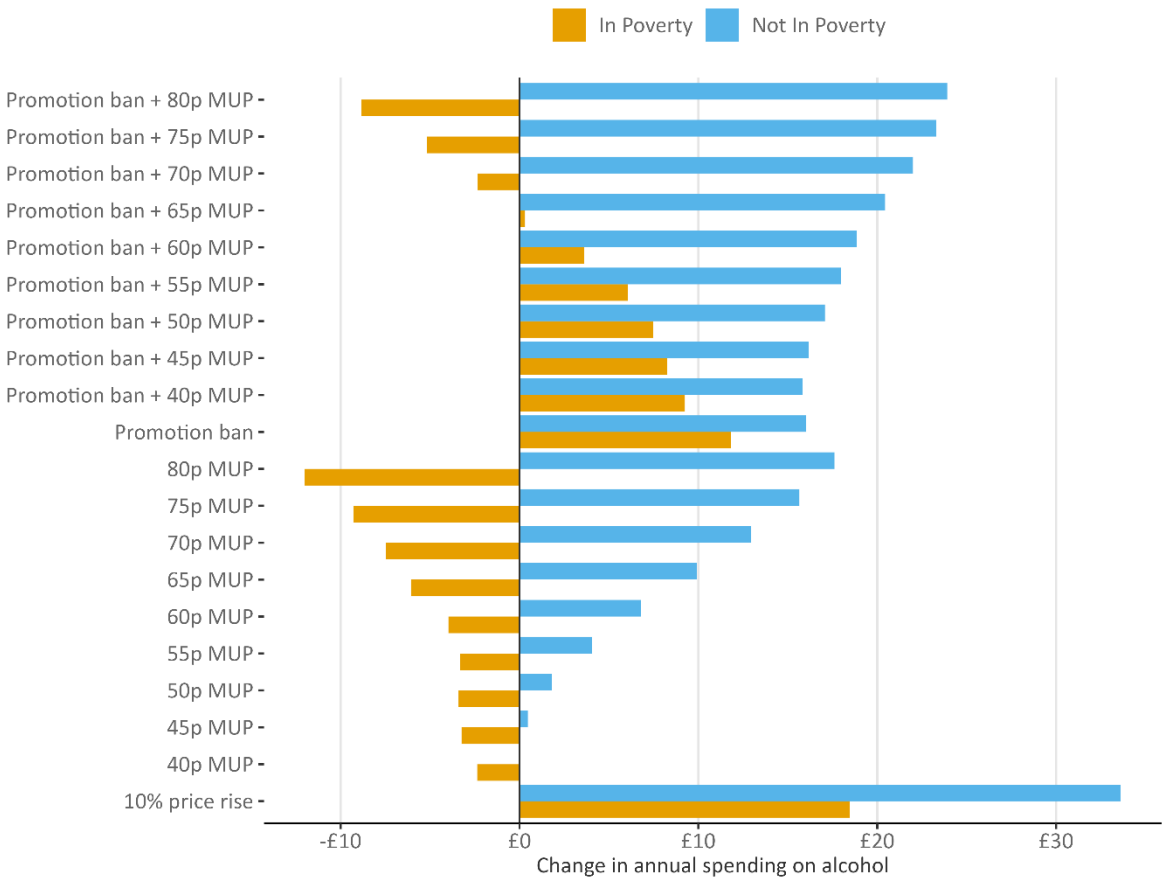
MUP, the increase in spending among moderate and higher risk drinkers increases further as the MUP level rises, but the spending increase in higher risk drinkers falls, becoming a spending *reduction* at MUP levels of 70p and above.

Figure 11: Modelled policy impacts on consumer spending on alcohol by drinker group



Similarly diverse patterns of spending impact can be seen between income groups, with MUP policies estimated to reduce spending among those in poverty, but increase spending for those not in poverty, with both effects increasing in size as the MUP threshold increases. A promotion ban increases spending across both income groups, but when combined with a MUP, while the impact on drinkers not in poverty's spending increases further as the MUP threshold rises, the impact on drinkers in poverty falls, becoming a spending reduction for MUP levels above 65p/unit.

Figure 12: Modelled policy impacts on consumer spending on alcohol by income group



The joint change in spending on alcohol across drinker and income groups is shown in Table 18. The most notable feature of these results is that for MUP policies, increases in spending among moderate and increasing risk drinkers are smaller in drinkers in poverty, while higher risk drinkers in poverty are estimated to see substantial reductions in spending on alcohol. This contrasts with higher risk drinkers not in poverty who are estimated to see relatively much smaller changes in their spending.

Table 18: Modelled policy impacts on consumer spending on alcohol by drink and income group

	Moderate		Increasing Risk		Higher Risk	
	In Poverty	Not In Poverty	In Poverty	Not In Poverty	In Poverty	Not In Poverty
Baseline						
Drinker population	126241	653251	38727	185340	7157	31485
Mean annual spend	£237	£295	£1024	£1149	£2752	£3212
Policy impact (relative change)						
10% price rise	£13.8 (5.8%)	£24.5 (8.3%)	£30.9 (3%)	£57.6 (5%)	£32.7 (1.2%)	£81.1 (2.5%)
40p MUP	£-0.1 (0%)	£0.3 (0.1%)	£-1.8 (-0.2%)	£-0.7 (-0.1%)	£-45.7 (-1.7%)	£-3.6 (-0.1%)
45p MUP	£0.3 (0.1%)	£0.8 (0.3%)	£-0.2 (0%)	£0.6 (0%)	£-81.6 (-3%)	£-7.7 (-0.2%)
50p MUP	£0.7 (0.3%)	£1.6 (0.5%)	£4.5 (0.4%)	£4.2 (0.4%)	£-118.8 (-4.3%)	£-7.9 (-0.2%)
55p MUP	£1.4 (0.6%)	£2.6 (0.9%)	£10.1 (1%)	£10.3 (0.9%)	£-159 (-5.8%)	£-2.4 (-0.1%)
60p MUP	£2.2 (0.9%)	£4 (1.3%)	£15.2 (1.5%)	£18.2 (1.6%)	£-217.2 (-7.9%)	£-2.1 (-0.1%)
65p MUP	£3.1 (1.3%)	£5.8 (2%)	£16.9 (1.6%)	£28.2 (2.5%)	£-291.7 (-10.6%)	£-11.9 (-0.4%)
70p MUP	£4 (1.7%)	£7.7 (2.6%)	£16.1 (1.6%)	£38.7 (3.4%)	£-337.2 (-12.3%)	£-29.3 (-0.9%)
75p MUP	£4.8 (2%)	£9.7 (3.3%)	£14.5 (1.4%)	£48.5 (4.2%)	£-386.4 (-14%)	£-54.6 (-1.7%)
80p MUP	£5.2 (2.2%)	£11.8 (4%)	£11.4 (1.1%)	£56.9 (5%)	£-442.7 (-16.1%)	£-93.4 (-2.9%)
Promotion ban	£0 (0%)	£1.5 (0.5%)	£32.5 (3.2%)	£48.4 (4.2%)	£107.5 (3.9%)	£126.2 (3.9%)
Promotion ban + 40p MUP	£0 (0%)	£1.9 (0.6%)	£30.2 (2.9%)	£47.3 (4.1%)	£58.5 (2.1%)	£119.4 (3.7%)
Promotion ban + 45p MUP	£0.4 (0.2%)	£2.4 (0.8%)	£31.5 (3.1%)	£48.1 (4.2%)	£21.2 (0.8%)	£114.4 (3.6%)
Promotion ban + 50p MUP	£0.8 (0.3%)	£3.1 (1%)	£34.8 (3.4%)	£50.5 (4.4%)	£-22.4 (-0.8%)	£110.8 (3.4%)
Promotion ban + 55p MUP	£1.3 (0.5%)	£3.9 (1.3%)	£37 (3.6%)	£53.1 (4.6%)	£-77.2 (-2.8%)	£102.4 (3.2%)
Promotion ban + 60p MUP	£1.8 (0.8%)	£5 (1.7%)	£38.1 (3.7%)	£56.2 (4.9%)	£-151.1 (-5.5%)	£86.2 (2.7%)
Promotion ban + 65p MUP	£2.6 (1.1%)	£6.5 (2.2%)	£36.6 (3.6%)	£62.1 (5.4%)	£-235.9 (-8.6%)	£65.3 (2%)
Promotion ban + 70p MUP	£3.3 (1.4%)	£8 (2.7%)	£32.4 (3.2%)	£68.5 (6%)	£-290.2 (-10.5%)	£38 (1.2%)
Promotion ban + 75p MUP	£4 (1.7%)	£9.7 (3.3%)	£28.1 (2.7%)	£74.5 (6.5%)	£-347 (-12.6%)	£3 (0.1%)
Promotion ban + 80p MUP	£4.4 (1.9%)	£11.6 (3.9%)	£21.8 (2.1%)	£79.3 (6.9%)	£-408.5 (-14.8%)	£-46.4 (-1.4%)

Exchequer and retailer revenue

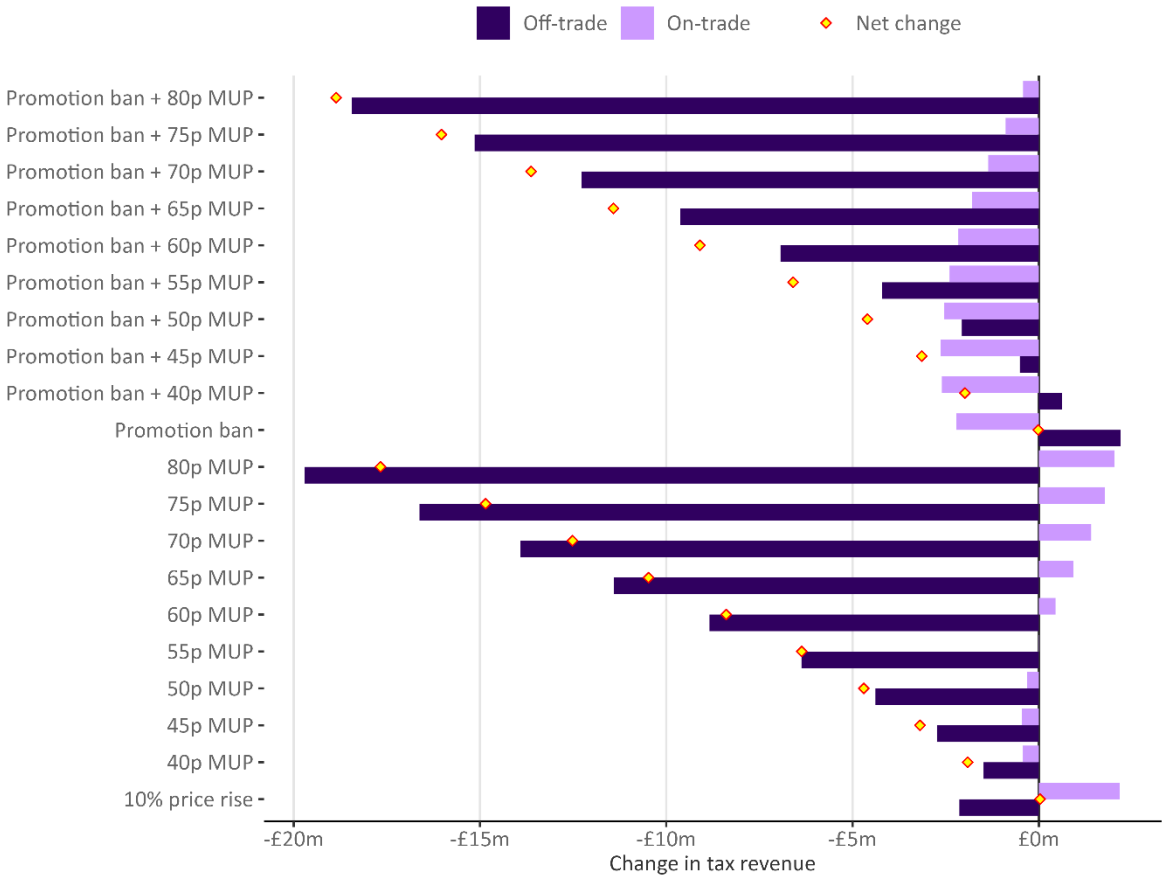
The modelled impact of all policies on tax revenue to the exchequer (from a combination of alcohol duties and VAT) and on revenue to retailers (after accounting for changes in tax) is shown in Table 19, with exchequer impacts illustrated in Figure 13 and retailer revenue changes shown in Figure 14,

Table 19: Modelled policy impacts on annual exchequer and retailer revenue

	Change in tax revenue to government (duty + VAT)			Change in retailer revenue (after accounting for tax)		
	Off-trade	On-trade	Total	Off-trade	On-trade	Total
Baseline						
Annual receipts	£157.9m	£155.1m	£312.9m	£147.7m	£333.1m	£480.8m
Policy impact (relative change)						
10% price rise	£-2.1m (-1.4%)	£2.2m (1.4%)	£0m (0%)	£16.4m (11.1%)	£26.8m (8%)	£43.2m (9%)
40p MUP	£-1.5m (-0.9%)	£-0.4m (-0.3%)	£-1.9m (-0.6%)	£1.9m (1.3%)	£-0.6m (-0.2%)	£1.3m (0.3%)
45p MUP	£-2.7m (-1.7%)	£-0.5m (-0.3%)	£-3.2m (-1%)	£3.4m (2.3%)	£-0.4m (-0.1%)	£3m (0.6%)
50p MUP	£-4.4m (-2.8%)	£-0.3m (-0.2%)	£-4.7m (-1.5%)	£5.8m (3.9%)	£0.2m (0.1%)	£6m (1.2%)
55p MUP	£-6.4m (-4%)	£0m (0%)	£-6.4m (-2%)	£9.2m (6.2%)	£1.1m (0.3%)	£10.3m (2.1%)
60p MUP	£-8.8m (-5.6%)	£0.4m (0.3%)	£-8.4m (-2.7%)	£12.9m (8.7%)	£2.4m (0.7%)	£15.3m (3.2%)
65p MUP	£-11.4m (-7.2%)	£0.9m (0.6%)	£-10.5m (-3.3%)	£16.7m (11.3%)	£3.9m (1.2%)	£20.6m (4.3%)
70p MUP	£-13.9m (-8.8%)	£1.4m (0.9%)	£-12.5m (-4%)	£20.5m (13.9%)	£5.3m (1.6%)	£25.8m (5.4%)
75p MUP	£-16.6m (-10.5%)	£1.8m (1.1%)	£-14.9m (-4.7%)	£24.2m (16.4%)	£6.6m (2%)	£30.9m (6.4%)
80p MUP	£-19.7m (-12.5%)	£2m (1.3%)	£-17.7m (-5.6%)	£27.6m (18.7%)	£7.8m (2.3%)	£35.3m (7.3%)
Promotion ban	£2.2m (1.4%)	£-2.2m (-1.4%)	£0m (0%)	£26.8m (18.1%)	£-5.5m (-1.7%)	£21.3m (4.4%)
Promotion ban + 40p MUP	£0.6m (0.4%)	£-2.6m (-1.7%)	£-2m (-0.6%)	£28.4m (19.3%)	£-6m (-1.8%)	£22.4m (4.7%)
Promotion ban + 45p MUP	£-0.5m (-0.3%)	£-2.6m (-1.7%)	£-3.1m (-1%)	£29.6m (20%)	£-5.8m (-1.7%)	£23.8m (4.9%)
Promotion ban + 50p MUP	£-2.1m (-1.3%)	£-2.5m (-1.6%)	£-4.6m (-1.5%)	£31.4m (21.3%)	£-5.3m (-1.6%)	£26.1m (5.4%)
Promotion ban + 55p MUP	£-4.2m (-2.7%)	£-2.4m (-1.5%)	£-6.6m (-2.1%)	£33.5m (22.7%)	£-4.7m (-1.4%)	£28.8m (6%)
Promotion ban + 60p MUP	£-6.9m (-4.4%)	£-2.2m (-1.4%)	£-9.1m (-2.9%)	£35.6m (24.1%)	£-3.8m (-1.1%)	£31.8m (6.6%)
Promotion ban + 65p MUP	£-9.6m (-6.1%)	£-1.8m (-1.2%)	£-11.4m (-3.6%)	£37.8m (25.6%)	£-2.6m (-0.8%)	£35.2m (7.3%)
Promotion ban + 70p MUP	£-12.3m (-7.8%)	£-1.4m (-0.9%)	£-13.6m (-4.4%)	£39.8m (26.9%)	£-1.2m (-0.4%)	£38.6m (8%)
Promotion ban + 75p MUP	£-15.1m (-9.6%)	£-0.9m (-0.6%)	£-16m (-5.1%)	£41.5m (28.1%)	£0.4m (0.1%)	£41.8m (8.7%)
Promotion ban + 80p MUP	£-18.4m (-11.7%)	£-0.4m (-0.3%)	£-18.9m (-6%)	£42.5m (28.8%)	£2m (0.6%)	£44.5m (9.3%)

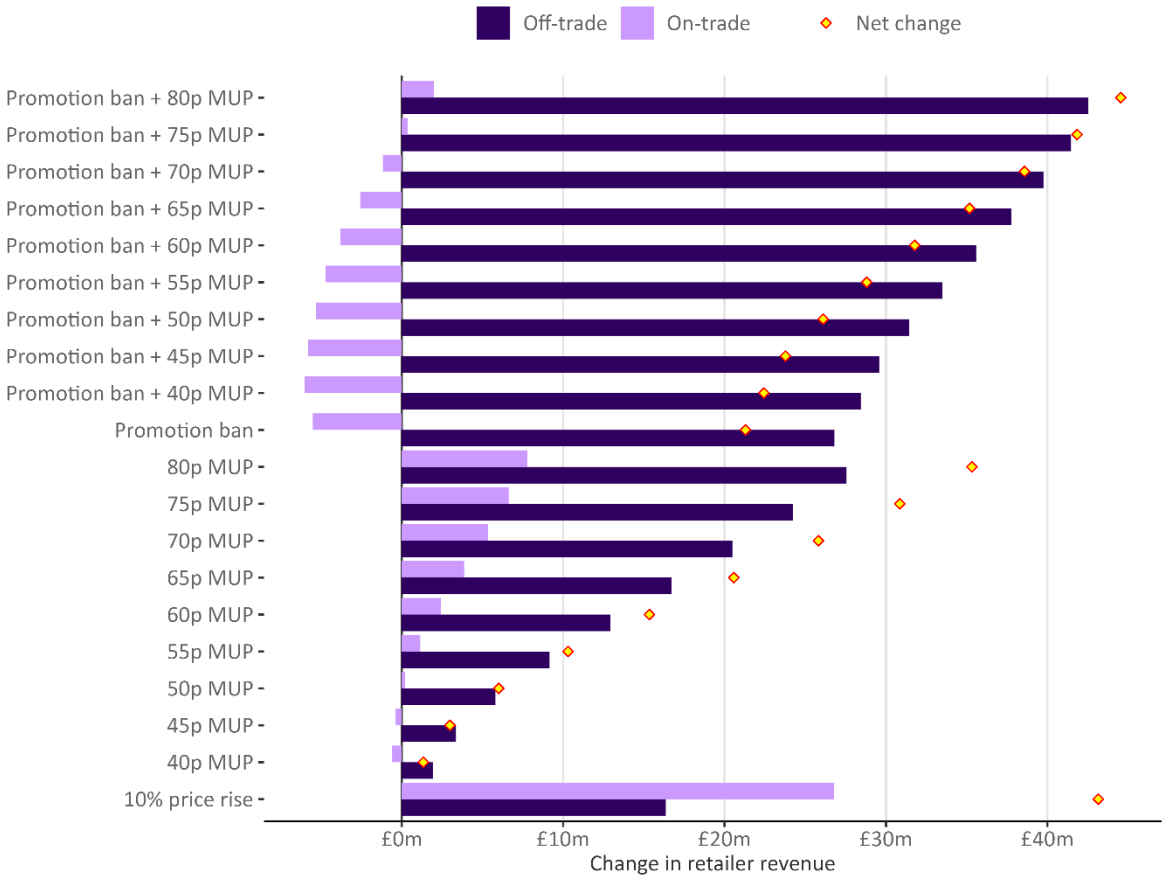
Overall a ban on off-trade promotions is estimated to be revenue neutral to tax revenues, although this arises from an increase in off-trade receipts being offset by a decrease in on-trade receipts. For all policies involving an MUP, either with or without a promotion ban, overall exchequer revenue is expected to fall. This fall is largely driven by a reduction in off-trade tax revenue, as increased VAT receipts on sales of alcohol whose prices have increased under the MUP are more than offset by reductions in duty and VAT due to reductions in overall alcohol sales volumes. Tax revenues from the on-trade are estimated to reduce at MUP thresholds below 55p and increase at thresholds above it for an MUP alone, but on-trade tax revenues are estimated to fall under all combined MUP and promotion ban policies.

Figure 13: Modelled policy impacts on annual exchequer revenue from alcohol taxes (VAT & duty)



Under all modelled policies, net revenue to retailers is estimated to increase, although this increase is disproportionately seen in the off-trade. This is as a consequence of it being almost exclusively off-trade prices that are affected by all modelled policies, so the only impact on on-trade revenue comes from the knock-on effect to the on-trade of prices changes in the off-trade. As the MUP threshold increases, retailer revenue is estimated to increase, while under a promotion ban, both in isolation and when combined with all MUP thresholds below 75p, on-trade retailer revenue falls.

Figure 14: Modelled policy impacts on estimated annual retailer revenue



Mortality

The estimated impacts, at full effect (i.e. 20 years after the policy is implemented), of all 20 modelled policies on alcohol-attributable deaths are shown in Table 20 and Table 21. These tables present the results in different formats. Table 20 shows the absolute changes in deaths under each policy in each population group (i.e. the total numbers). However, there are substantially different numbers of people in each group – around 20 times as many moderate drinkers as higher risk drinkers, for example – meaning that direct comparisons of absolute numbers between groups can be misleading. When comparing between groups it is therefore better to adjust the absolute numbers in line with the relative number of people in each group by calculating rates. These rates are shown in Table 21, which also illustrates the relative change in these rates. A comparison of the impact on mortality rates by drinker group is illustrated in Figure 15 and by income group in Figure 16.

Table 20: Modelled absolute impacts on annual alcohol-attributable deaths at full effect

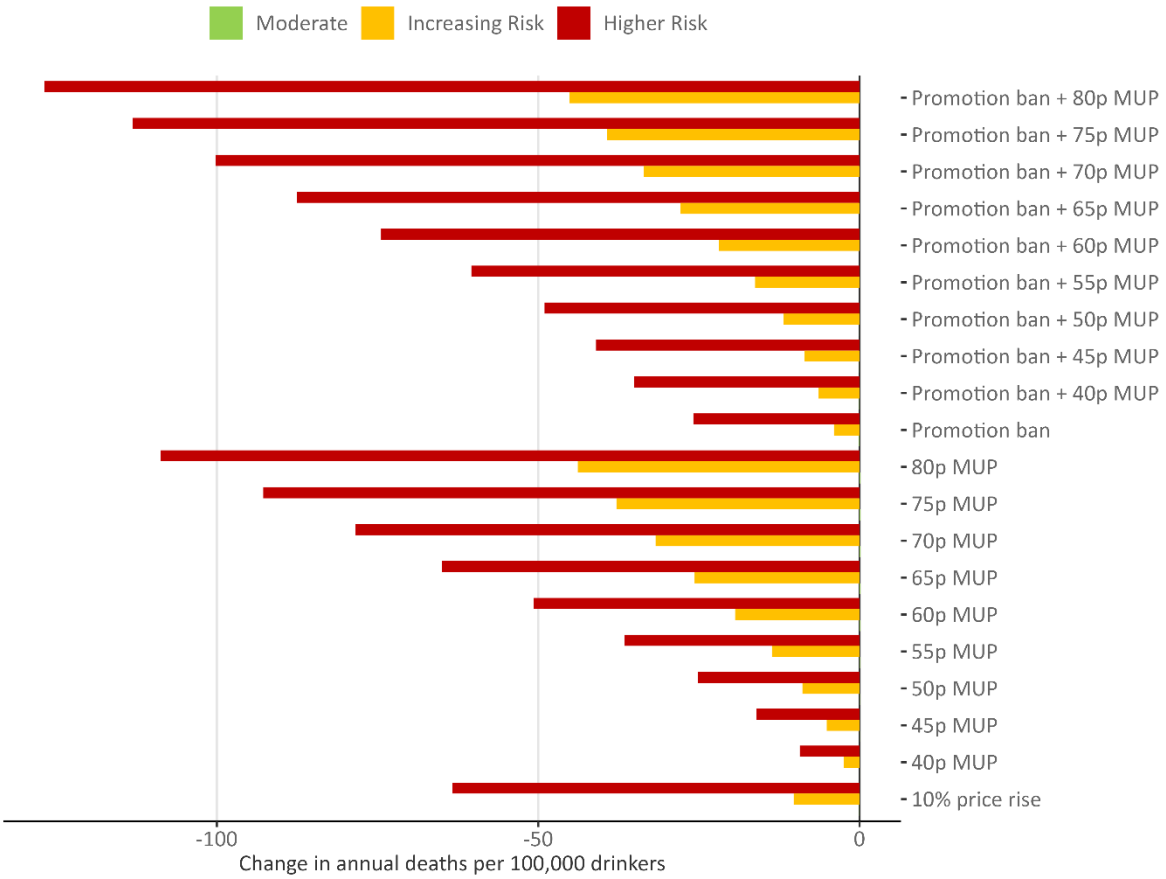
		Drinker group			Income group	
	All Drinkers	Moderate	Increasing Risk	Higher Risk	In Poverty	Not In Poverty
Baseline						
Annual alcohol-attributable deaths	448	−32	138	342	155	294
Policy impact						
10% price rise	−48	−1	−23	−24	−15	−33
40p MUP	−9	0	−6	−4	−4	−5
45p MUP	−17	0	−11	−6	−7	−10
50p MUP	−29	1	−20	−10	−11	−18
55p MUP	−44	1	−31	−14	−17	−27
60p MUP	−62	1	−43	−20	−24	−38
65p MUP	−82	1	−58	−25	−32	−49
70p MUP	−100	1	−71	−30	−39	−62
75p MUP	−120	1	−85	−36	−45	−75
80p MUP	−139	1	−98	−42	−51	−88
Promotion ban	−20	−1	−9	−10	−5	−15
Promotion ban + 40p MUP	−29	−1	−14	−14	−9	−20
Promotion ban + 45p MUP	−36	−1	−19	−16	−11	−24
Promotion ban + 50p MUP	−46	−1	−27	−19	−15	−31
Promotion ban + 55p MUP	−60	0	−36	−23	−21	−39
Promotion ban + 60p MUP	−78	0	−49	−29	−28	−50
Promotion ban + 65p MUP	−96	0	−62	−34	−35	−61
Promotion ban + 70p MUP	−114	0	−75	−39	−41	−73
Promotion ban + 75p MUP	−132	0	−88	−44	−47	−85
Promotion ban + 80p MUP	−150	0	−101	−49	−53	−97

Table 21: Modelled impacts on alcohol-attributable mortality rates at full effect

		Drinker group			Income group	
	All Drinkers	Moderate	Increasing Risk	Higher Risk	In Poverty	Not In Poverty
Baseline						
Annual alcohol-attributable deaths per 100,000 drinkers	32.3	-2.8	61.7	884.6	61.8	25.8
Policy impact						
10% price rise	-3.5 (-10.8%)	-0.1 (2.4%)	-10.3 (-16.6%)	-63.3 (-7.2%)	-5.9 (-9.5%)	-2.9 (-11.4%)
40p MUP	-0.6 (-2%)	0 (-0.7%)	-2.5 (-4%)	-9.3 (-1.1%)	-1.7 (-2.8%)	-0.4 (-1.6%)
45p MUP	-1.2 (-3.9%)	0 (-1.2%)	-5.1 (-8.3%)	-16.1 (-1.8%)	-2.9 (-4.7%)	-0.9 (-3.4%)
50p MUP	-2.1 (-6.5%)	0.1 (-1.8%)	-8.9 (-14.4%)	-25.2 (-2.8%)	-4.5 (-7.3%)	-1.6 (-6%)
55p MUP	-3.2 (-9.8%)	0.1 (-2.4%)	-13.6 (-22.1%)	-36.6 (-4.1%)	-6.8 (-11.1%)	-2.4 (-9.2%)
60p MUP	-4.5 (-13.9%)	0.1 (-2.8%)	-19.4 (-31.4%)	-50.7 (-5.7%)	-9.7 (-15.8%)	-3.3 (-12.9%)
65p MUP	-5.9 (-18.2%)	0.1 (-3.2%)	-25.7 (-41.6%)	-65 (-7.3%)	-12.9 (-20.9%)	-4.3 (-16.8%)
70p MUP	-7.2 (-22.4%)	0.1 (-3.3%)	-31.7 (-51.5%)	-78.5 (-8.9%)	-15.5 (-25.1%)	-5.4 (-21%)
75p MUP	-8.6 (-26.7%)	0.1 (-3.2%)	-37.8 (-61.3%)	-92.8 (-10.5%)	-18 (-29.1%)	-6.6 (-25.4%)
80p MUP	-10 (-31.1%)	0.1 (-3%)	-43.8 (-71.1%)	-108.7 (-12.3%)	-20.3 (-32.9%)	-7.8 (-30.1%)
Promotion ban	-1.4 (-4.5%)	-0.1 (3.2%)	-4 (-6.5%)	-25.9 (-2.9%)	-1.9 (-3.1%)	-1.3 (-5.2%)
Promotion ban + 40p MUP	-2.1 (-6.4%)	-0.1 (2.6%)	-6.4 (-10.3%)	-35.1 (-4%)	-3.5 (-5.7%)	-1.7 (-6.8%)
Promotion ban + 45p MUP	-2.6 (-8%)	-0.1 (2.2%)	-8.6 (-13.9%)	-41 (-4.6%)	-4.6 (-7.4%)	-2.1 (-8.3%)
Promotion ban + 50p MUP	-3.3 (-10.3%)	0 (1.7%)	-11.8 (-19.2%)	-49 (-5.5%)	-6.1 (-9.9%)	-2.7 (-10.5%)
Promotion ban + 55p MUP	-4.3 (-13.4%)	0 (1.1%)	-16.3 (-26.4%)	-60.4 (-6.8%)	-8.3 (-13.3%)	-3.5 (-13.5%)
Promotion ban + 60p MUP	-5.6 (-17.4%)	0 (0.5%)	-21.9 (-35.4%)	-74.5 (-8.4%)	-11.1 (-17.9%)	-4.4 (-17.1%)
Promotion ban + 65p MUP	-6.9 (-21.5%)	0 (0%)	-27.9 (-45.2%)	-87.5 (-9.9%)	-14 (-22.7%)	-5.4 (-20.9%)
Promotion ban + 70p MUP	-8.2 (-25.4%)	0 (-0.3%)	-33.6 (-54.5%)	-100.2 (-11.3%)	-16.4 (-26.6%)	-6.4 (-24.8%)
Promotion ban + 75p MUP	-9.5 (-29.4%)	0 (-0.5%)	-39.3 (-63.7%)	-113.1 (-12.8%)	-18.7 (-30.3%)	-7.5 (-28.9%)
Promotion ban + 80p MUP	-10.8 (-33.5%)	0 (-0.6%)	-45.1 (-73.1%)	-126.9 (-14.3%)	-21 (-34%)	-8.6 (-33.2%)

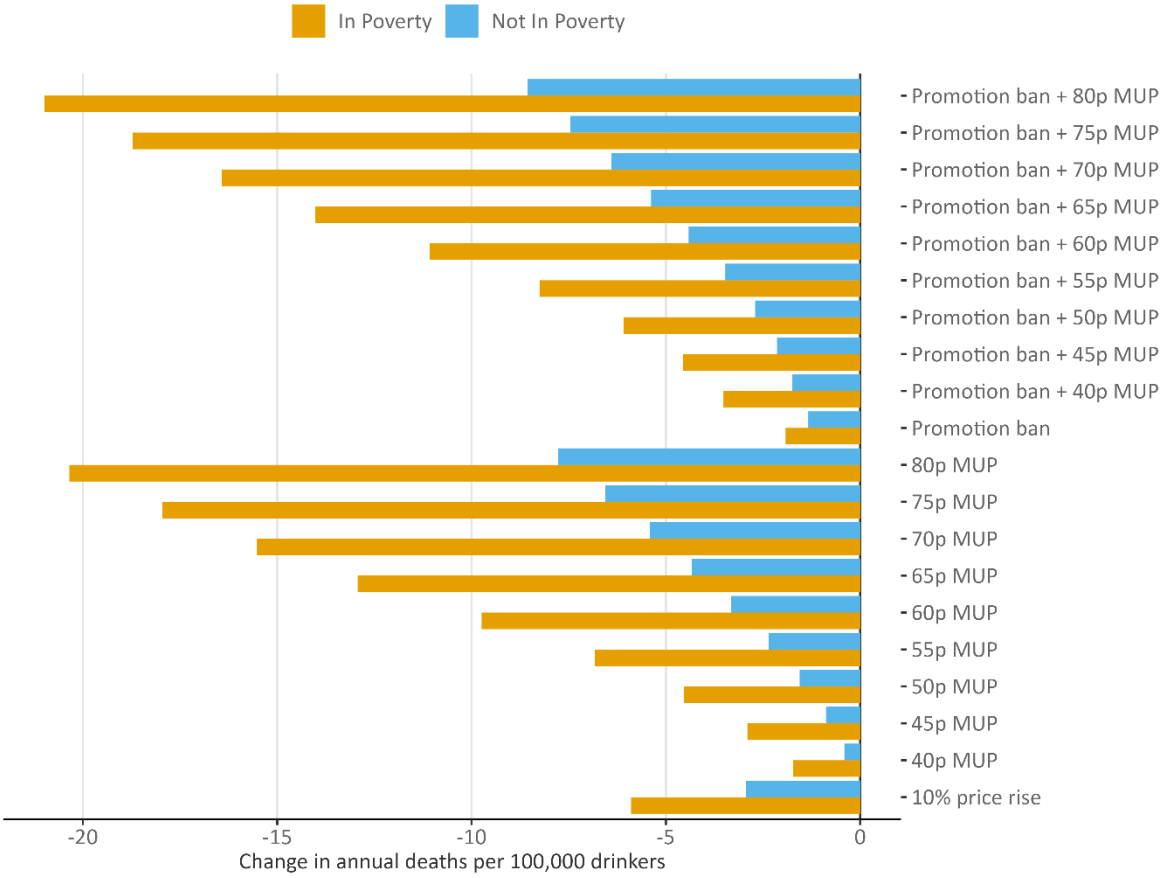
Minimum Unit Price policies are estimated to reduce annual alcohol-related mortality by between 9 (-2%) and 139 (-31.1%) for a 40p to 80p MUP respectively. As for the impact on alcohol consumption, a ban on off-trade price based promotions is estimated to have a marginally smaller impact than a 50p MUP (-20 deaths per year vs. -29 deaths). Combining a promotion ban with MUP leads to a larger reduction in mortality than for an equivalent MUP on its own. Across all policies there is very little change in mortality among moderate drinkers and the largest absolute reductions among higher risk drinkers.

Figure 15: Modelled impacts on alcohol-attributable mortality rates at full effect by drinker group



For all policies the largest absolute reduction in alcohol-related harm is among drinkers in poverty. For MUP policies alone, and for higher MUP thresholds in combination with a promotion ban, the largest *relative* reductions are also among drinkers in poverty, in spite of the fact that this group have much higher baseline levels of harm.

Figure 16: Modelled impacts on alcohol-attributable mortality rates at full effect by income group



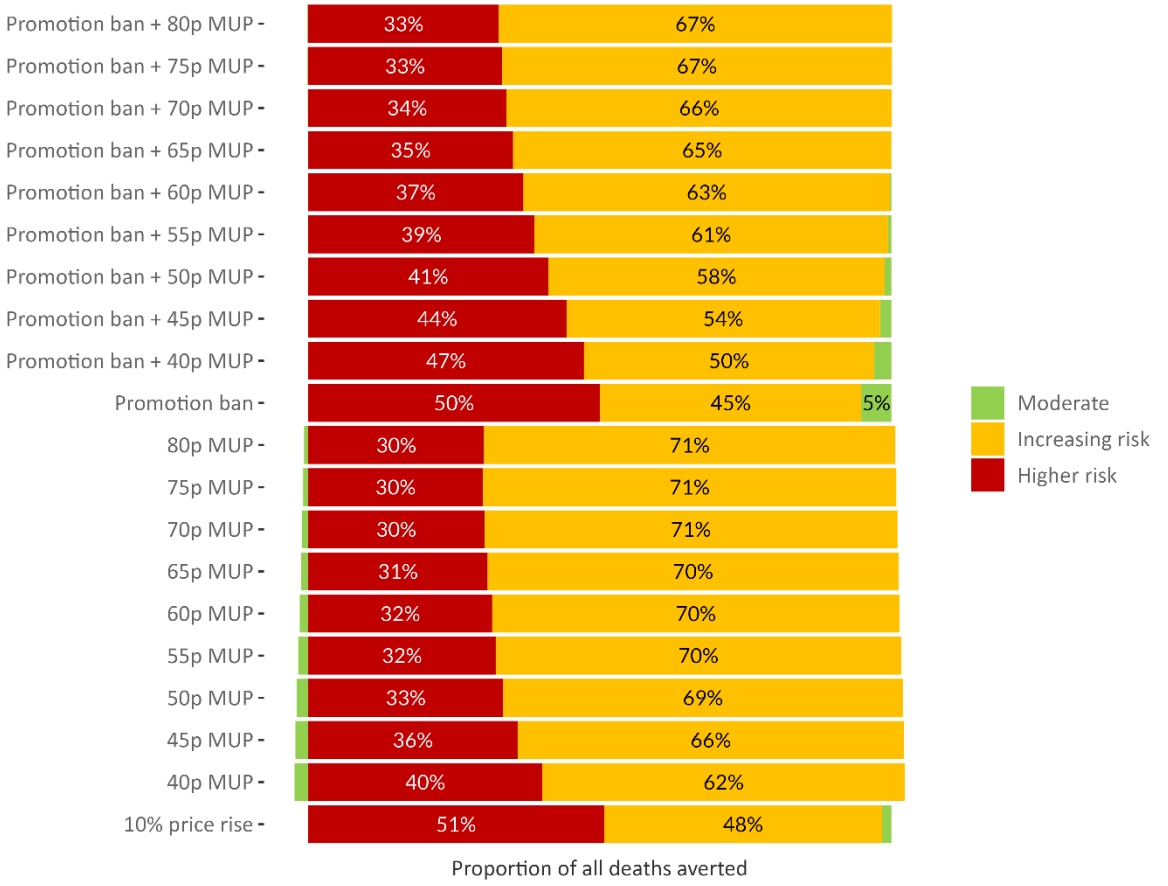
The joint modelled impact of all modelled policies on alcohol-attributable deaths by drinker and income group is shown in Table 22. In common with the baseline harm patterns shown in Figure 5 this shows that, within each drinker group, reductions in mortality are greatest among drinkers in poverty in both absolute and relative terms, for all policies except a promotion ban alone, or in combination with lower MUP levels.

Table 22: Modelled impacts on alcohol-attributable mortality rates at full effect by drinker and income group

	Moderate		Increasing Risk		Higher Risk	
	In Poverty	In Poverty	In Poverty	Not In Poverty	In Poverty	Not In Poverty
Baseline						
Annual alcohol-attributable deaths per 100,000 drinkers	-2.3	-3	102.7	53.1	1668.8	706.4
Policy impact						
10% price rise	-0.1 (3.4%)	-0.1 (2.2%)	-22.4 (-21.8%)	-8.5 (-16.1%)	-82.8 (-5%)	-54.1 (-7.7%)
40p MUP	0 (-1.2%)	0 (-0.6%)	-3.3 (-3.2%)	-1.3 (-2.4%)	-43.2 (-2.6%)	-7.9 (-1.1%)
45p MUP	0.1 (-2.2%)	0 (-1%)	-5.5 (-5.3%)	-2.2 (-4.1%)	-73.3 (-4.4%)	-19.7 (-2.8%)
50p MUP	0.1 (-3.5%)	0 (-1.5%)	-8.8 (-8.5%)	-3.4 (-6.4%)	-113.5 (-6.8%)	-37.5 (-5.3%)
55p MUP	0.1 (-4.9%)	0.1 (-1.9%)	-14.1 (-13.7%)	-4.7 (-8.8%)	-165.7 (-9.9%)	-59.4 (-8.4%)
60p MUP	0.1 (-6.2%)	0.1 (-2.2%)	-21 (-20.4%)	-6.2 (-11.6%)	-230.8 (-13.8%)	-85.4 (-12.1%)
65p MUP	0.2 (-7.5%)	0.1 (-2.4%)	-28.8 (-28%)	-7.5 (-14.2%)	-301 (-18%)	-114.3 (-16.2%)
70p MUP	0.2 (-8.1%)	0.1 (-2.5%)	-36.1 (-35.1%)	-8.8 (-16.6%)	-352.4 (-21.1%)	-145.8 (-20.6%)
75p MUP	0.2 (-8.1%)	0.1 (-2.4%)	-43.1 (-42%)	-10.3 (-19.5%)	-399.5 (-23.9%)	-178.5 (-25.3%)
80p MUP	0.2 (-7.8%)	0.1 (-2.2%)	-50.2 (-48.9%)	-12.2 (-22.9%)	-444.5 (-26.6%)	-210.9 (-29.9%)
Promotion ban	-0.1 (3.8%)	-0.1 (3.1%)	-7.4 (-7.2%)	-3.8 (-7.2%)	-24.3 (-1.5%)	-22.9 (-3.2%)
Promotion ban + 40p MUP	-0.1 (2.6%)	-0.1 (2.6%)	-10.3 (-10%)	-5.2 (-9.7%)	-65.3 (-3.9%)	-30.5 (-4.3%)
Promotion ban + 45p MUP	0 (1.6%)	-0.1 (2.3%)	-12.1 (-11.8%)	-6 (-11.3%)	-92.8 (-5.6%)	-40 (-5.7%)
Promotion ban + 50p MUP	0 (0.4%)	-0.1 (1.9%)	-14.9 (-14.5%)	-7.1 (-13.4%)	-132.2 (-7.9%)	-54.2 (-7.7%)
Promotion ban + 55p MUP	0 (-1.1%)	0 (1.5%)	-19.6 (-19%)	-8.5 (-16%)	-183.2 (-11%)	-74.1 (-10.5%)
Promotion ban + 60p MUP	0.1 (-2.7%)	0 (1.1%)	-26 (-25.3%)	-10.1 (-19%)	-248.3 (-14.9%)	-99.2 (-14%)
Promotion ban + 65p MUP	0.1 (-4.4%)	0 (0.8%)	-32.9 (-32.1%)	-11.4 (-21.4%)	-314.5 (-18.8%)	-126.9 (-18%)
Promotion ban + 70p MUP	0.1 (-5.2%)	0 (0.5%)	-39.9 (-38.8%)	-12.6 (-23.6%)	-361.4 (-21.7%)	-156.9 (-22.2%)
Promotion ban + 75p MUP	0.1 (-5.6%)	0 (0.4%)	-46.6 (-45.4%)	-13.8 (-26.1%)	-405.4 (-24.3%)	-187.7 (-26.6%)
Promotion ban + 80p MUP	0.1 (-5.6%)	0 (0.2%)	-53.3 (-51.9%)	-15.3 (-28.8%)	-449 (-26.9%)	-218.9 (-31%)

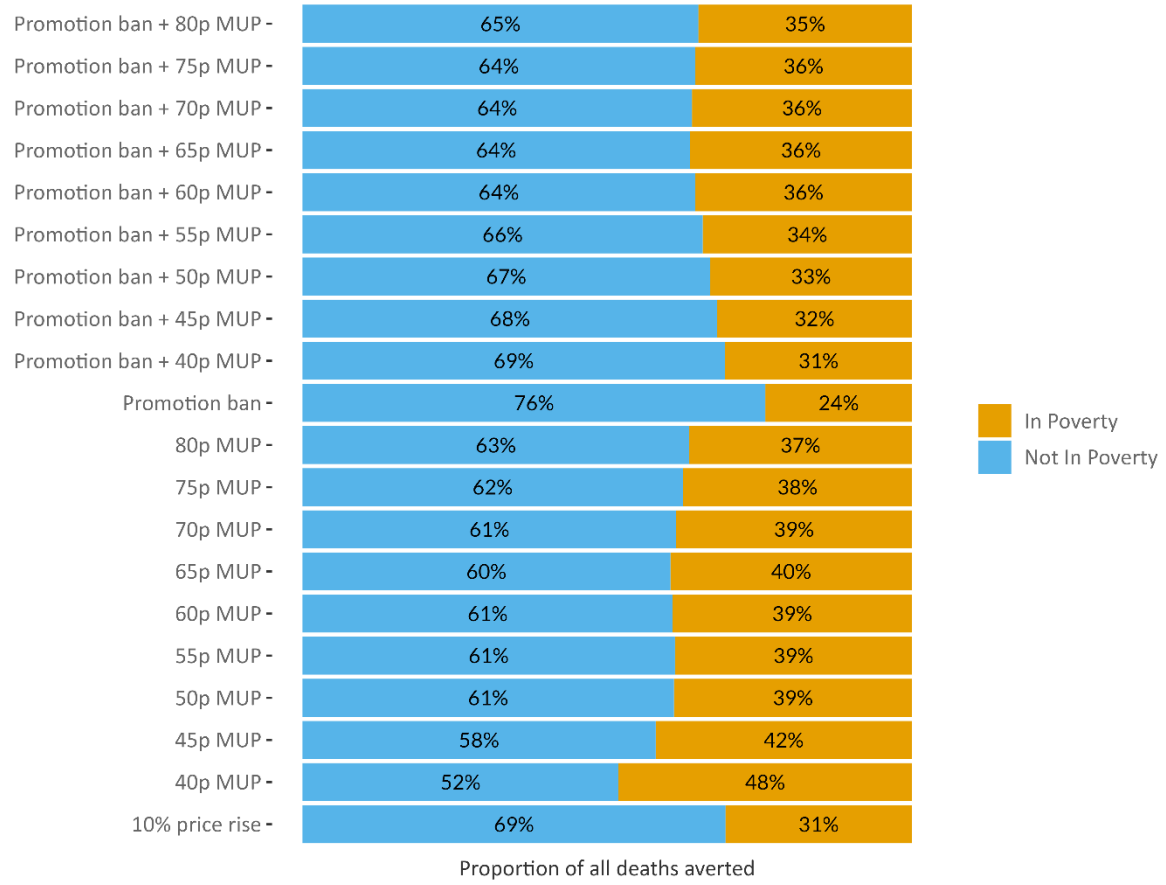
Additional visualisations of the proportion of the total reduction in alcohol-attributable deaths that comes from each drinker group and income group are shown in Figure 17 and Figure 18 respectively. These illustrate that across all MUP policies the majority of the reduction in deaths comes from the increasing risk group, because even though higher risk drinkers see a much larger reduction in mortality, the number of increasing risk drinkers is far higher.

Figure 17: Proportion of reductions in deaths at full effect coming from each drinker group under each policy



When looking at the proportion of the reduction in deaths that comes from each income group, we can see that not only does a disproportionate number of the reduction in mortality come from the 16.5% of drinkers who are in poverty, but that this difference is even greater than the proportion of the reduction in consumption shown in Figure 10.

Figure 18: Proportion of reductions in deaths at full effect coming from each income group under each policy



Hospital admissions

Modelled impacts of all 20 policies on annual alcohol-attributable hospital admissions, at full effect are shown in absolute terms in Table 23 and as rates, adjusted for the population in each drinker and income group, in Table 24. Change in admission rates by drinker group are illustrated in Figure 19 and by income group Figure 20.

Table 23: Modelled absolute impacts on annual alcohol-attributable hospital admissions at full effect

		Drinker group			Income group	
	All Drinkers	Moderate	Increasing Risk	Higher Risk	In Poverty	Not In Poverty
Baseline						
Annual alcohol-attributable admissions	23,490	−1,122	10,390	14,221	7,205	16,285
Policy impact						
10% price rise	−2,227	−128	−753	−1,345	−663	−1,563
40p MUP	−435	8	−249	−194	−160	−275
45p MUP	−815	15	−489	−341	−269	−546
50p MUP	−1,327	20	−807	−540	−420	−906
55p MUP	−1,935	20	−1,160	−795	−636	−1,299
60p MUP	−2,688	14	−1,580	−1,122	−906	−1,782
65p MUP	−3,482	−1	−2,004	−1,478	−1,197	−2,285
70p MUP	−4,262	−23	−2,413	−1,826	−1,479	−2,782
75p MUP	−5,051	−51	−2,802	−2,198	−1,739	−3,312
80p MUP	−5,907	−84	−3,214	−2,610	−2,005	−3,902
Promotion ban	−921	−112	−290	−519	−225	−697
Promotion ban + 40p MUP	−1,342	−105	−524	−712	−375	−967
Promotion ban + 45p MUP	−1,671	−100	−732	−840	−471	−1,201
Promotion ban + 50p MUP	−2,122	−94	−1,013	−1,016	−611	−1,511
Promotion ban + 55p MUP	−2,695	−92	−1,336	−1,267	−801	−1,894
Promotion ban + 60p MUP	−3,426	−94	−1,745	−1,587	−1,057	−2,369
Promotion ban + 65p MUP	−4,144	−101	−2,129	−1,915	−1,323	−2,821
Promotion ban + 70p MUP	−4,853	−113	−2,500	−2,241	−1,588	−3,265
Promotion ban + 75p MUP	−5,594	−131	−2,879	−2,584	−1,833	−3,761
Promotion ban + 80p MUP	−6,386	−153	−3,280	−2,953	−2,086	−4,301

Table 24: Modelled impacts on alcohol-attributable hospital admission rates at full effect

		Drinker group			Income group	
	All Drinkers	Moderate	Increasing Risk	Higher Risk	In Poverty	Not In Poverty
Baseline						
Annual alcohol-attributable admissions per 100,000 drinkers	1692.2	-99.7	4637.2	36802.8	2880.7	1431
Policy impact						
10% price rise	-160.4 (-9.5%)	-11.3 (11.4%)	-336.3 (-7.3%)	-3481.8 (-9.5%)	-265.3 (-9.2%)	-137.4 (-9.6%)
40p MUP	-31.4 (-1.9%)	0.7 (-0.7%)	-111.3 (-2.4%)	-502.5 (-1.4%)	-64.1 (-2.2%)	-24.2 (-1.7%)
45p MUP	-58.7 (-3.5%)	1.3 (-1.3%)	-218.3 (-4.7%)	-882 (-2.4%)	-107.5 (-3.7%)	-48 (-3.4%)
50p MUP	-95.6 (-5.6%)	1.8 (-1.8%)	-360 (-7.8%)	-1398.6 (-3.8%)	-168.1 (-5.8%)	-79.6 (-5.6%)
55p MUP	-139.4 (-8.2%)	1.8 (-1.8%)	-517.7 (-11.2%)	-2057.3 (-5.6%)	-254.2 (-8.8%)	-114.1 (-8%)
60p MUP	-193.6 (-11.4%)	1.2 (-1.2%)	-705 (-15.2%)	-2903.4 (-7.9%)	-362.4 (-12.6%)	-156.6 (-10.9%)
65p MUP	-250.9 (-14.8%)	-0.1 (0.1%)	-894.2 (-19.3%)	-3825.5 (-10.4%)	-478.7 (-16.6%)	-200.8 (-14%)
70p MUP	-307 (-18.1%)	-2 (2%)	-1076.7 (-23.2%)	-4725.7 (-12.8%)	-591.5 (-20.5%)	-244.5 (-17.1%)
75p MUP	-363.8 (-21.5%)	-4.5 (4.5%)	-1250.4 (-27%)	-5688.8 (-15.5%)	-695.1 (-24.1%)	-291 (-20.3%)
80p MUP	-425.5 (-25.1%)	-7.4 (7.4%)	-1434.2 (-30.9%)	-6754.1 (-18.4%)	-801.5 (-27.8%)	-342.9 (-24%)
Promotion ban	-66.4 (-3.9%)	-10 (10%)	-129.5 (-2.8%)	-1343.2 (-3.6%)	-89.9 (-3.1%)	-61.2 (-4.3%)
Promotion ban + 40p MUP	-96.7 (-5.7%)	-9.3 (9.4%)	-234.1 (-5%)	-1843.2 (-5%)	-149.8 (-5.2%)	-85 (-5.9%)
Promotion ban + 45p MUP	-120.4 (-7.1%)	-8.8 (8.9%)	-326.6 (-7%)	-2173.2 (-5.9%)	-188.1 (-6.5%)	-105.5 (-7.4%)
Promotion ban + 50p MUP	-152.9 (-9%)	-8.4 (8.4%)	-451.9 (-9.7%)	-2628.2 (-7.1%)	-244.4 (-8.5%)	-132.8 (-9.3%)
Promotion ban + 55p MUP	-194.2 (-11.5%)	-8.2 (8.2%)	-596.3 (-12.9%)	-3278.4 (-8.9%)	-320.2 (-11.1%)	-166.4 (-11.6%)
Promotion ban + 60p MUP	-246.8 (-14.6%)	-8.3 (8.4%)	-778.9 (-16.8%)	-4107 (-11.2%)	-422.5 (-14.7%)	-208.2 (-14.5%)
Promotion ban + 65p MUP	-298.5 (-17.6%)	-8.9 (9%)	-950.1 (-20.5%)	-4954.7 (-13.5%)	-528.8 (-18.4%)	-247.9 (-17.3%)
Promotion ban + 70p MUP	-349.6 (-20.7%)	-10 (10.1%)	-1115.5 (-24.1%)	-5798.3 (-15.8%)	-634.9 (-22%)	-286.9 (-20.1%)
Promotion ban + 75p MUP	-403 (-23.8%)	-11.6 (11.6%)	-1285.1 (-27.7%)	-6687.2 (-18.2%)	-733 (-25.4%)	-330.5 (-23.1%)
Promotion ban + 80p MUP	-460.1 (-27.2%)	-13.6 (13.6%)	-1464 (-31.6%)	-7643 (-20.8%)	-834 (-29%)	-377.9 (-26.4%)

The pattern of changes in hospital admissions is similar to the pattern in the mortality impacts. Across all policies alcohol-attributable admissions are estimated to fall, with the largest reductions in higher risk drinkers and those in poverty. Overall the relative reductions in hospital admission are slightly smaller than the reduction in alcohol-attributable deaths (e.g. a 6.5% reduction in deaths compared to a 5.6% reduction in admissions for a 50p MUP).

Figure 19: Modelled impacts on alcohol-attributable hospital admission rates at full effect by drinker group

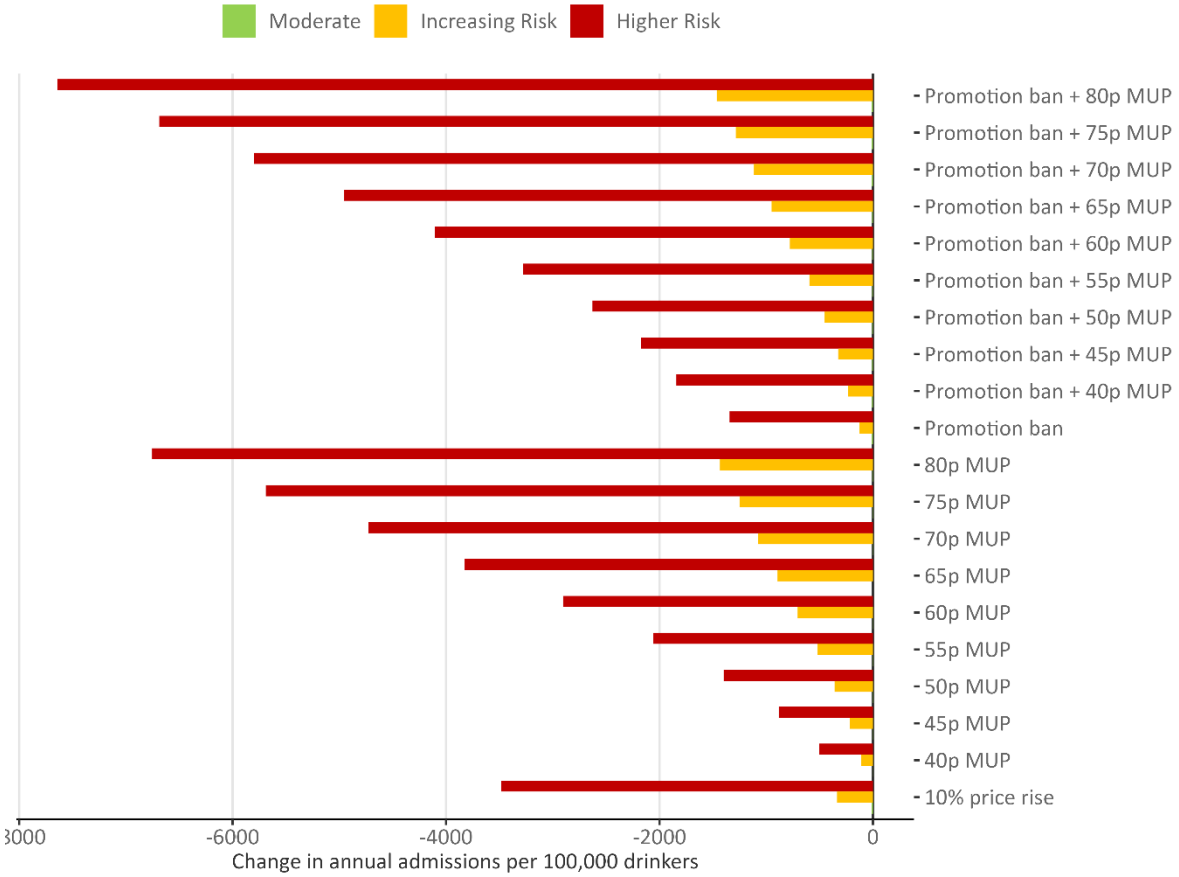
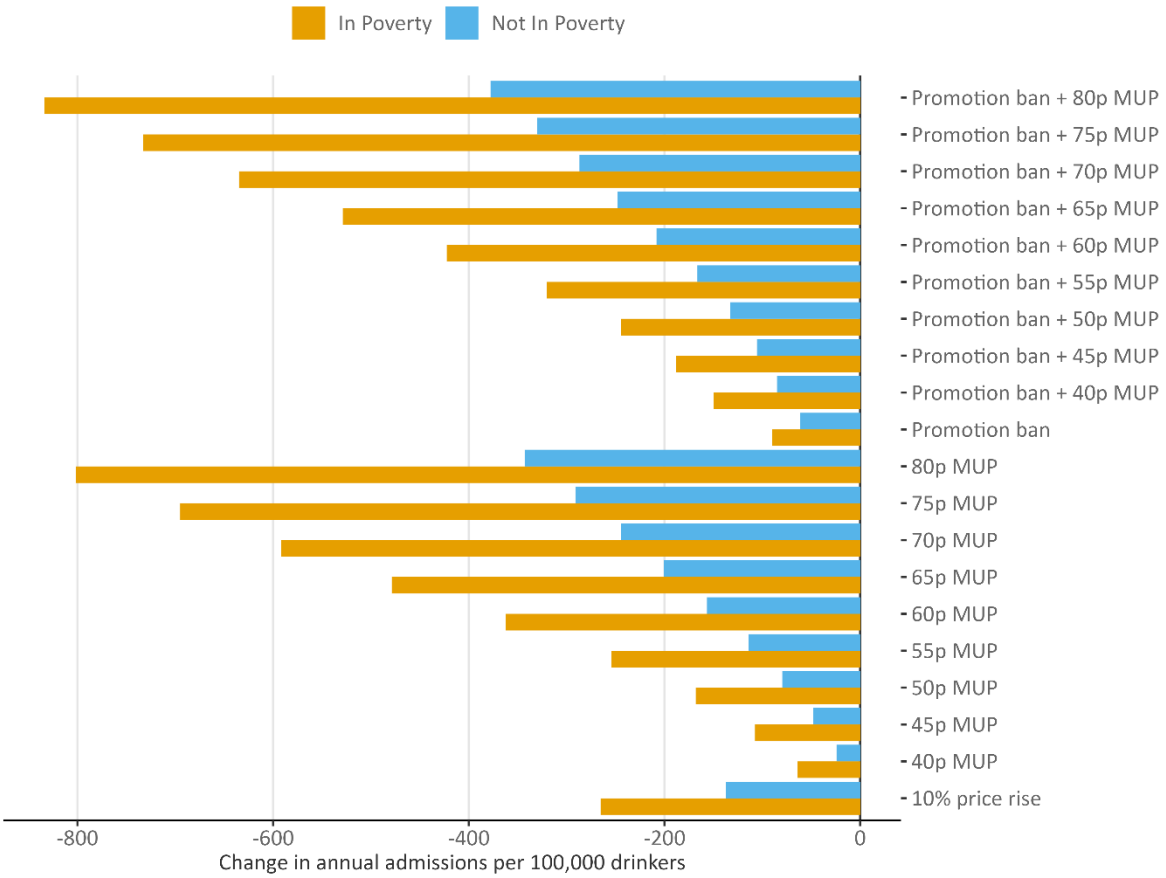


Figure 20: Modelled impacts on alcohol-attributable hospital admission rates at full effect by income group



Additional visualisations of the proportion of the total reduction in hospital admissions that comes from each drinker group and income group are shown in Figure 21 and Figure 22 respectively. These show similar patterns to the equivalent figures for the distribution of deaths, with the relatively larger number of increasing risk drinkers meaning that the majority of admissions averted under most policies comes from this group, while a greater proportion of the reduction in admissions comes from drinkers in poverty than would be expected based on the proportion of the population they represent.

Figure 21: Proportion of reductions in hospital admissions at full effect coming from each drinker group under each policy

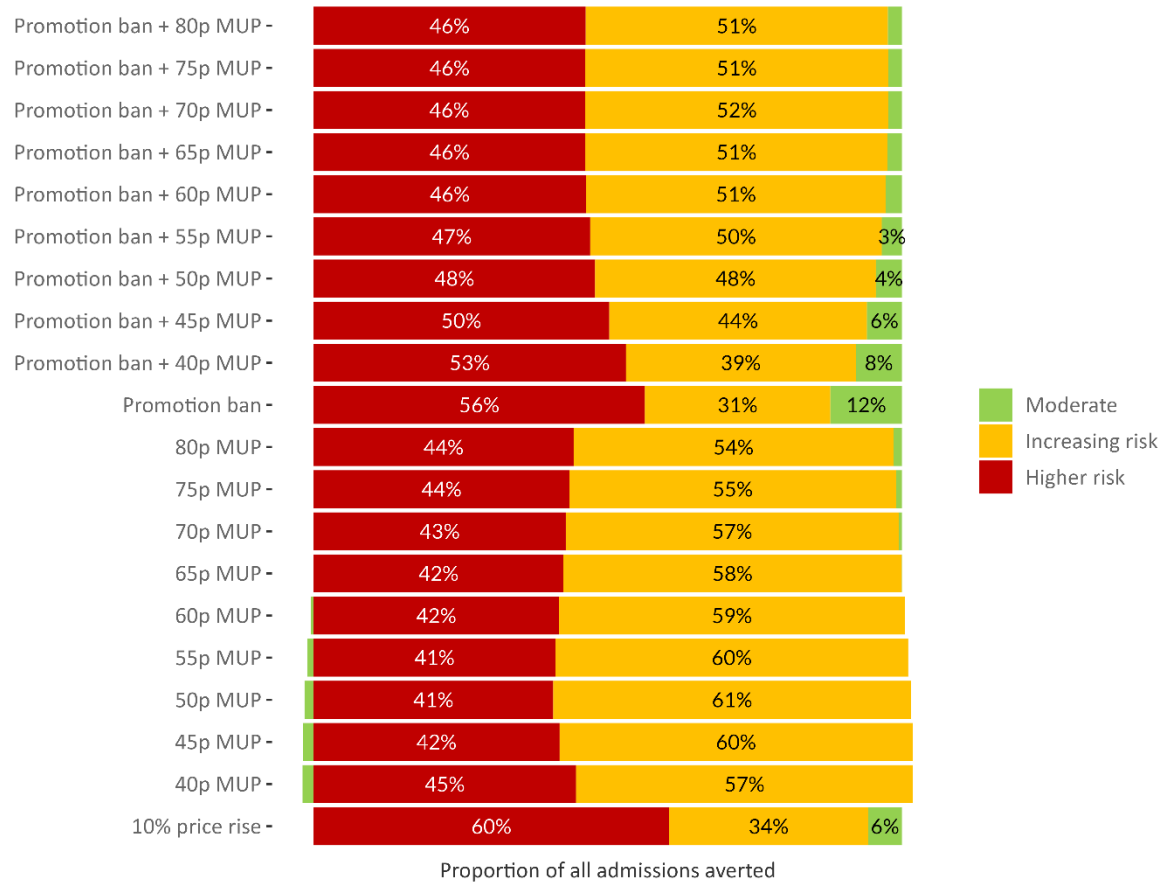
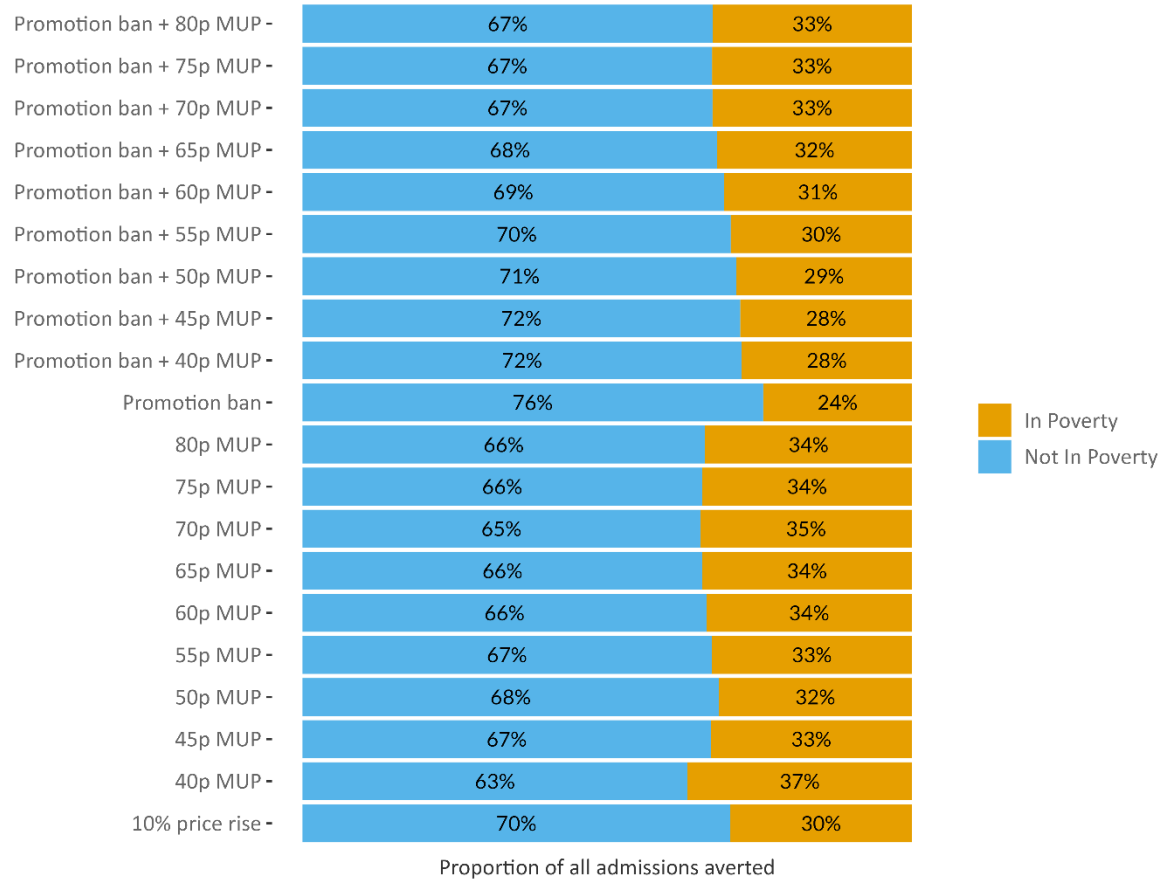


Figure 22: Proportion of reductions in hospital admissions at full effect coming from each income group under each policy



Patterns in reductions in hospital admissions across drinker and income groups together are shown in Table 25. Again, these follow similar patterns to the mortality impacts shown in Table 22, but with slightly smaller relative reductions.

Table 25: Modelled impacts on alcohol-attributable hospital admission rates at full effect by drinker and income group

	Moderate		Increasing Risk		Higher Risk	
	In Poverty	In Poverty	In Poverty	Not In Poverty	Not In Poverty	Not In Poverty
Baseline						
Annual alcohol-attributable admissions per 100,000 drinkers	-5.7	-120.5	7074.6	4127.9	62548.5	30950.2
Policy impact						
10% price rise	-14.9 (264.4%)	-10.6 (8.8%)	-1218.8 (-17.2%)	-471.2 (-11.4%)	-2248.6 (-3.6%)	-1882 (-6.1%)
40p MUP	0.2 (-4.4%)	0.8 (-0.7%)	-193.7 (-2.7%)	-64.3 (-1.6%)	-1199.1 (-1.9%)	-519.4 (-1.7%)
45p MUP	0.7 (-12.8%)	1.5 (-1.2%)	-316.4 (-4.5%)	-117.8 (-2.9%)	-2065.6 (-3.3%)	-1084.3 (-3.5%)
50p MUP	1 (-18.3%)	2 (-1.7%)	-498.4 (-7%)	-187.4 (-4.5%)	-3205 (-5.1%)	-1833.6 (-5.9%)
55p MUP	1.1 (-18.7%)	2 (-1.6%)	-791.5 (-11.2%)	-263.5 (-6.4%)	-4629.4 (-7.4%)	-2631.6 (-8.5%)
60p MUP	0.5 (-9.1%)	1.4 (-1.1%)	-1173.3 (-16.6%)	-360.2 (-8.7%)	-6329.2 (-10.1%)	-3578.6 (-11.6%)
65p MUP	-0.8 (13.9%)	0.1 (-0.1%)	-1608.2 (-22.7%)	-461.5 (-11.2%)	-8004.8 (-12.8%)	-4543.9 (-14.7%)
70p MUP	-3.2 (55.8%)	-1.8 (1.5%)	-2032 (-28.7%)	-560.7 (-13.6%)	-9585.5 (-15.3%)	-5483.9 (-17.7%)
75p MUP	-6.6 (116.6%)	-4 (3.3%)	-2456.3 (-34.7%)	-672.8 (-16.3%)	-10812.3 (-17.3%)	-6441.2 (-20.8%)
80p MUP	-10.5 (186.4%)	-6.7 (5.6%)	-2892.3 (-40.9%)	-803.8 (-19.5%)	-12058.7 (-19.3%)	-7465.7 (-24.1%)
Promotion ban	-11 (194%)	-9.8 (8.1%)	-403.8 (-5.7%)	-195.7 (-4.7%)	-643.5 (-1%)	-775.5 (-2.5%)
Promotion ban + 40p MUP	-10.7 (188.6%)	-9 (7.5%)	-579.7 (-8.2%)	-263.2 (-6.4%)	-1794.3 (-2.9%)	-1257.8 (-4.1%)
Promotion ban + 45p MUP	-10.1 (178.9%)	-8.6 (7.1%)	-683.4 (-9.7%)	-310.3 (-7.5%)	-2588.2 (-4.1%)	-1735.9 (-5.6%)
Promotion ban + 50p MUP	-9.6 (170%)	-8.1 (6.7%)	-834.9 (-11.8%)	-373.5 (-9%)	-3747.7 (-6%)	-2364.3 (-7.6%)
Promotion ban + 55p MUP	-9.3 (164%)	-8 (6.6%)	-1093.9 (-15.5%)	-454.9 (-11%)	-5007.2 (-8%)	-3105.5 (-10%)
Promotion ban + 60p MUP	-9 (160%)	-8.2 (6.8%)	-1447.9 (-20.5%)	-553.7 (-13.4%)	-6673.2 (-10.7%)	-4025.9 (-13%)
Promotion ban + 65p MUP	-9.3 (163.7%)	-8.9 (7.4%)	-1838.4 (-26%)	-648.9 (-15.7%)	-8268.5 (-13.2%)	-4882.2 (-15.8%)
Promotion ban + 70p MUP	-10.7 (189.5%)	-9.9 (8.2%)	-2242.8 (-31.7%)	-740.2 (-17.9%)	-9744.3 (-15.6%)	-5723.8 (-18.5%)
Promotion ban + 75p MUP	-13 (230.7%)	-11.3 (9.4%)	-2648.8 (-37.4%)	-840.7 (-20.4%)	-10910.1 (-17.4%)	-6665.5 (-21.5%)
Promotion ban + 80p MUP	-16 (283.3%)	-13 (10.8%)	-3061.2 (-43.3%)	-953.9 (-23.1%)	-12123 (-19.4%)	-7663.2 (-24.8%)

In order to illustrate the extent to which MUP policies reduce harms across different health conditions, the full effect reduction in deaths and admissions by condition group under an illustrative 50p MUP policy is shown in Table 26. This shows that around half of the total reduction in mortality (-29 deaths) under this policy comes from a fall in deaths from liver disease, while around half of the reduction in hospital admissions (1,327) comes from fewer admissions due to mental and behavioural disorders due to alcohol.

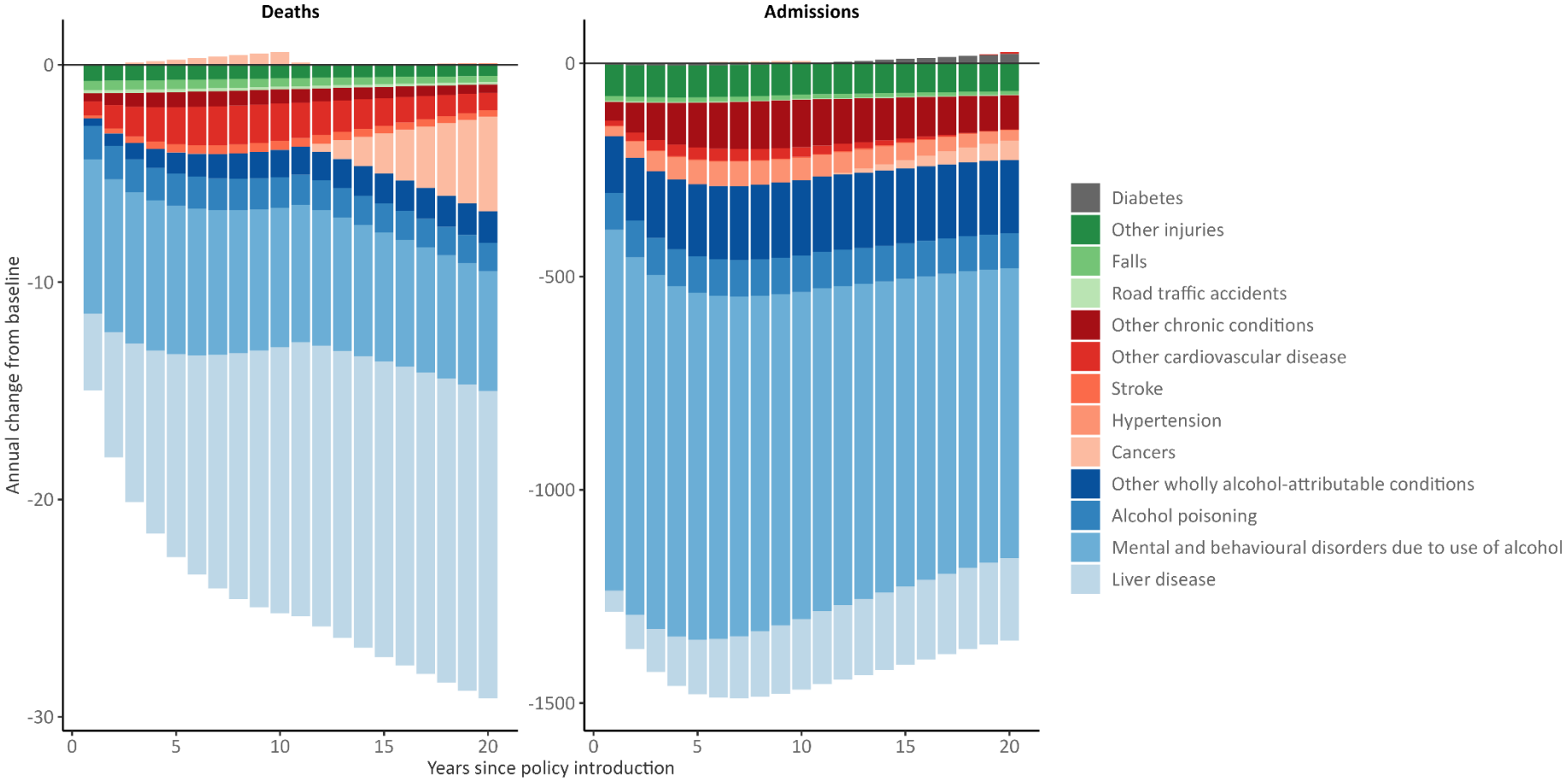
Table 26: Full effect (year 20) impacts of a 50p MUP policy on alcohol-attributable health harms by condition

	Annual change in alcohol-attributable	
	Deaths	Admissions
Wholly alcohol-attributable		
Liver disease	-14 (-6.9%)	-193 (-8.4%)
Mental and behavioural disorders due to use of alcohol	-6 (-7.2%)	-680 (-8.6%)
Alcohol poisoning	-1 (-3.8%)	-82 (-3.6%)
Other wholly alcohol-attributable conditions	-1 (-7.9%)	-172 (-5%)
Chronic conditions		
Cancers	-4 (-3%)	-46 (-3%)
Hypertension	0 (0.4%)	-24 (-0.3%)
Stroke	0 (-1.4%)	-2 (-7.6%)
Other cardiovascular disease[1]	-1 (0.7%)	5 (-0.1%)
Diabetes[1]	0 (-0.7%)	22 (-3.4%)
Other chronic conditions	0 (-1.3%)	-80 (-2.2%)
Injuries		
Road traffic accidents	0 (-3.6%)	-2 (-3.5%)
Falls	0 (-2.5%)	-8 (-3.6%)
Other injuries	-1 (-3.3%)	-65 (-4%)

[1] Note that these conditions are estimated to have negative alcohol-attributable baseline deaths and admissions (see Table 5) and therefore absolute *increases* represent *negative* relative changes

The extent to which health outcome changes are spread over time, by condition, is shown in Figure 23. This illustrates the delay in reaching the 'full effect' of each policy in mortality due to the time lag between changes in consumption leading to change in risk of harm, with the short-term impact of the policy in the first year estimated to be around half of the full effect total. There are a few other interesting patterns to note in this figure. The first is that the reduction in hospital admissions peaks in year 7 rather than in year 20. This is because the reduction in alcohol-attributable mortality in the early years after the policy is implemented leads to more people aging into older age groups which have higher rates of hospital admissions for alcohol-related causes, with this effect more than offsetting the lagged reductions in admissions due to the policy's impact on alcohol consumption after this point. The second is a similar phenomenon happening with alcohol-attributable cancer mortality. Epidemiological evidence suggests that risks of cancer due to alcohol do not change for a decade after changes in consumption [39]. As a result, in the first 10 years after a 50p MUP is implemented there is no reduction in cancers, and indeed we see a slight increase, as people who have been prevented from dying from other alcohol-related causes die later due to alcohol-attributable cancers. This small increase is eliminated after the reduction in cancer risk due to the consumption changes arising from the policy begin to take effect after 10 years and by 20 years after the policy is introduced roughly 1 in 7 of all deaths averted due to the policy is from cancer.

Figure 23: Distribution over time of impacts of a 50p MUP policy on alcohol-attributable health harms by condition



The impacts of these modelled changes in hospital admissions on NHS costs is shown in Table 27. MUP policies are estimated to reduce alcohol-attributable healthcare costs by between £0.7m and £7.7m in the first year after implementation, increasing slightly to between £0.7m and £9.7m in year 20. A promotion ban is estimated to save the NHS £1m in the first year after implementation, rising to £1.5m after 20 years, while a promotion ban combined with an MUP has a marginally larger impact on NHS costs than the MUP policy alone.

Table 27: Modelled impacts on NHS costs attributable to alcohol (undiscounted)

	Change in NHS costs due to alcohol (£millions)		
	Year 1	Year 20	Cumulative over 20 years
10% price rise	−£2.5	−£3.6	−£69.5
40p MUP	−£0.7	−£0.7	−£15.3
45p MUP	−£1.2	−£1.4	−£28.4
50p MUP	−£1.9	−£2.2	−£45.8
55p MUP	−£2.8	−£3.2	−£66.2
60p MUP	−£3.8	−£4.5	−£91.3
65p MUP	−£4.8	−£5.8	−£117.4
70p MUP	−£5.8	−£7.1	−£142.1
75p MUP	−£6.7	−£8.3	−£166.7
80p MUP	−£7.7	−£9.7	−£193.0
Promotion ban	−£1.0	−£1.5	−£28.3
Promotion ban + 40p MUP	−£1.6	−£2.2	−£42.9
Promotion ban + 45p MUP	−£2.1	−£2.8	−£54.1
Promotion ban + 50p MUP	−£2.7	−£3.5	−£69.4
Promotion ban + 55p MUP	−£3.5	−£4.5	−£88.7
Promotion ban + 60p MUP	−£4.5	−£5.7	−£113.0
Promotion ban + 65p MUP	−£5.4	−£6.9	−£136.7
Promotion ban + 70p MUP	−£6.3	−£8.0	−£159.1
Promotion ban + 75p MUP	−£7.2	−£9.2	−£182.1
Promotion ban + 80p MUP	−£8.1	−£10.5	−£206.6

Crime

The estimated impact of all modelled policies on alcohol-related crime volumes and costs is shown in Table 28. The introduction of an MUP is estimated to reduce alcohol-related offences by between 449 (for a 40p MUP) and 5,561 (for an 80p MUP) each year, with a corresponding reduction in the societal costs of crime of between £4m and £52m annually. Banning all off-trade price-based promotions is estimated to have a similar impact to a 45p MUP, leading to 777 fewer offences (-3.7%) and reducing costs by £7m (-3.7%). Combining both policies leads to larger reductions in crime than introducing an MUP alone.

Table 28: Modelled impacts on alcohol-attributable crimes and associated costs

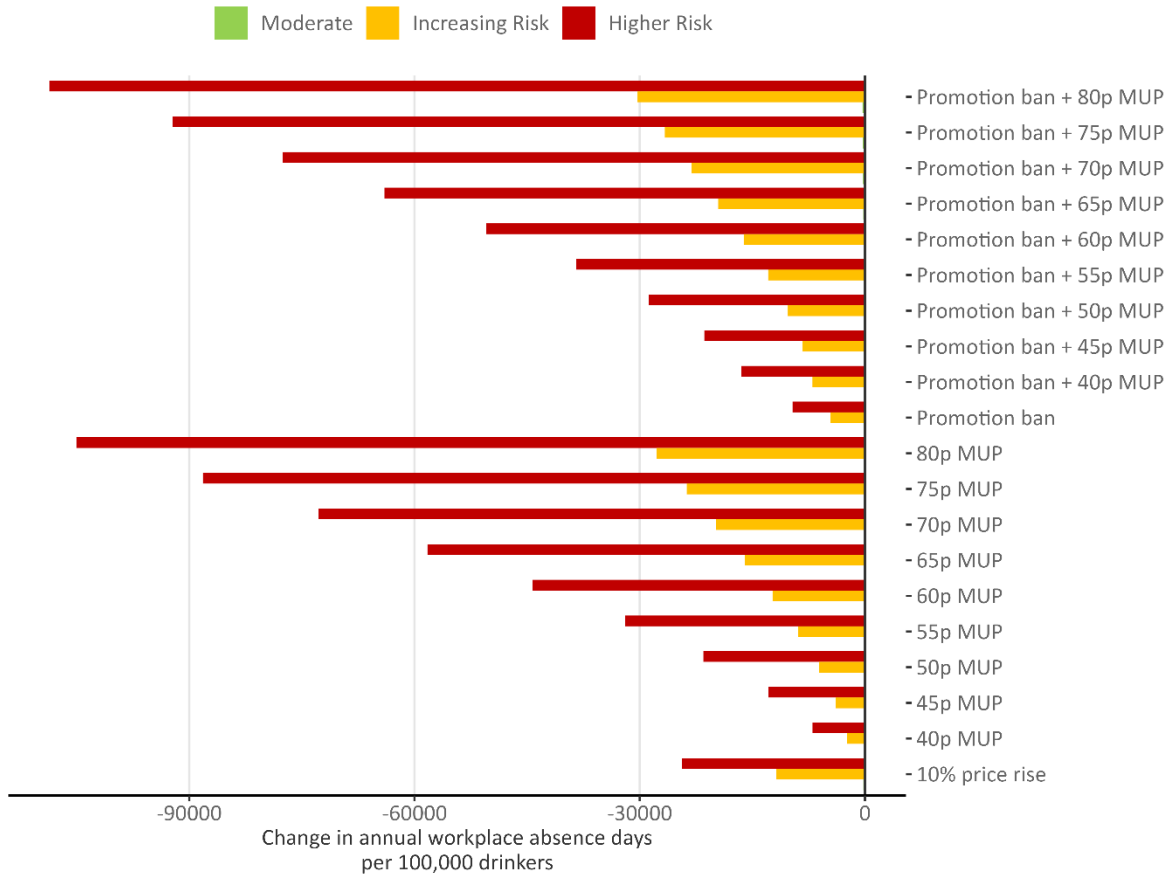
	Alcohol-attributable offences	Annual cost (£m)
Baseline	20981	£195
Policy impact		
10% price rise	-2007 (-9.6%)	-£19 (-9.5%)
40p MUP	-449 (-2.1%)	-£4 (-2.1%)
45p MUP	-763 (-3.6%)	-£7 (-3.6%)
50p MUP	-1222 (-5.8%)	-£11 (-5.8%)
55p MUP	-1796 (-8.6%)	-£17 (-8.5%)
60p MUP	-2468 (-11.8%)	-£23 (-11.7%)
65p MUP	-3188 (-15.2%)	-£30 (-15.2%)
70p MUP	-3940 (-18.8%)	-£36 (-18.7%)
75p MUP	-4730 (-22.5%)	-£44 (-22.5%)
80p MUP	-5561 (-26.5%)	-£52 (-26.5%)
Promotion ban	-777 (-3.7%)	-£7 (-3.7%)
Promotion ban + 40p MUP	-1220 (-5.8%)	-£11 (-5.8%)
Promotion ban + 45p MUP	-1493 (-7.1%)	-£14 (-7.1%)
Promotion ban + 50p MUP	-1887 (-9%)	-£17 (-9%)
Promotion ban + 55p MUP	-2416 (-11.5%)	-£22 (-11.5%)
Promotion ban + 60p MUP	-3063 (-14.6%)	-£28 (-14.6%)
Promotion ban + 65p MUP	-3742 (-17.8%)	-£35 (-17.8%)
Promotion ban + 70p MUP	-4449 (-21.2%)	-£41 (-21.2%)
Promotion ban + 75p MUP	-5181 (-24.7%)	-£48 (-24.6%)
Promotion ban + 80p MUP	-5959 (-28.4%)	-£55 (-28.3%)

The extent to which these changes in offences vary between drinker groups is shown in Table 29 and illustrated in Figure 24. These results show substantially greater impacts on alcohol-attributable crimes among higher risk drinkers than other groups.

Table 29: Modelled impacts on alcohol-attributable crime rates by drinker group

		Drinker Group		
	All Drinkers	Moderate	Increasing Risk	Higher Risk
Baseline				
Annual alcohol-attributable offences per 100,000 drinkers	1,511	79	5,203	21,837
Policy impact				
10% price rise	−145	−9	−628	−1,303
40p MUP	−32	0	−136	−365
45p MUP	−55	0	−224	−671
50p MUP	−88	0	−350	−1,124
55p MUP	−129	−1	−508	−1,671
60p MUP	−178	−2	−690	−2,322
65p MUP	−230	−4	−876	−3,061
70p MUP	−284	−5	−1,069	−3,839
75p MUP	−341	−7	−1,269	−4,665
80p MUP	−401	−10	−1,474	−5,568
Promotion ban	−56	−8	−224	−486
Promotion ban + 40p MUP	−88	−8	−360	−841
Promotion ban + 45p MUP	−108	−8	−437	−1,098
Promotion ban + 50p MUP	−136	−8	−546	−1,483
Promotion ban + 55p MUP	−174	−8	−693	−1,989
Promotion ban + 60p MUP	−221	−9	−869	−2,619
Promotion ban + 65p MUP	−270	−10	−1,044	−3,334
Promotion ban + 70p MUP	−320	−12	−1,226	−4,067
Promotion ban + 75p MUP	−373	−13	−1,409	−4,859
Promotion ban + 80p MUP	−429	−15	−1,596	−5,743

Figure 24: Modelled impact on alcohol-attributable crime rates by drinker group



Workplace outcomes

The modelled impact on alcohol-attributable workplace absence days across all modelled policies, and the associated cost to the Northern Irish economy is shown in Table 30. Introducing an MUP policy is estimated to reduce workplace absence by between 8,038 (for a 40p MUP) and 105,055 (for an 80p MUP) with an associated cost saving of between £900,000 and £12.5m (respectively). A ban on all off-trade price-based promotions is estimated to have a slightly smaller impact on workplace absence than a 50p MUP – 16,519 fewer absence days, saving £1.9m.

Table 30: Modelled impacts on alcohol-attributable workplace absence and associated costs

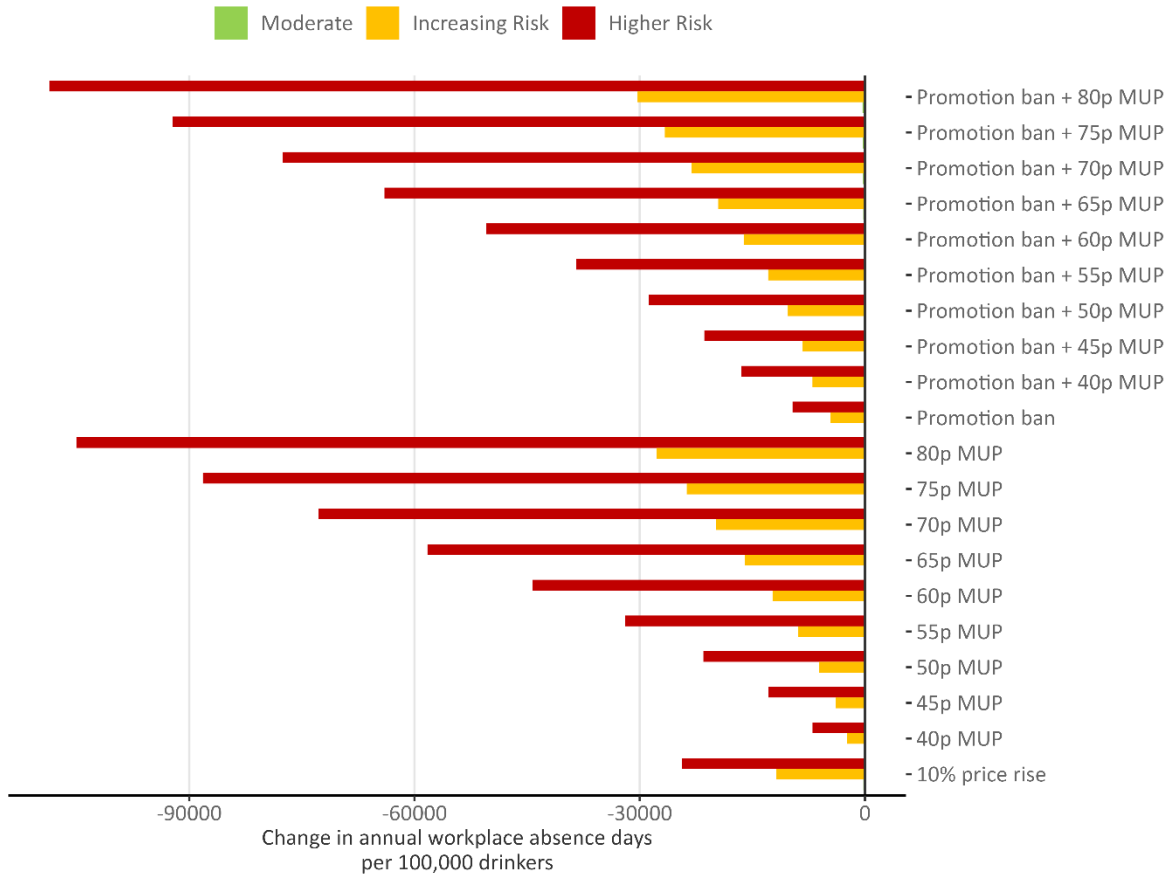
	Alcohol-attributable absences (days)	Annual cost (£m)
Baseline	426237	£50.4
Policy impact		
10% price rise	-38479 (-9%)	-£4.6 (-9.1%)
40p MUP	-8038 (-1.9%)	-£0.9 (-1.9%)
45p MUP	-13592 (-3.2%)	-£1.6 (-3.2%)
50p MUP	-21778 (-5.1%)	-£2.6 (-5.1%)
55p MUP	-32182 (-7.6%)	-£3.8 (-7.6%)
60p MUP	-44837 (-10.5%)	-£5.3 (-10.6%)
65p MUP	-58910 (-13.8%)	-£7 (-13.9%)
70p MUP	-73584 (-17.3%)	-£8.7 (-17.3%)
75p MUP	-88902 (-20.9%)	-£10.5 (-20.9%)
80p MUP	-105055 (-24.6%)	-£12.5 (-24.8%)
Promotion ban	-16519 (-3.9%)	-£1.9 (-3.8%)
Promotion ban + 40p MUP	-24482 (-5.7%)	-£2.9 (-5.7%)
Promotion ban + 45p MUP	-29300 (-6.9%)	-£3.4 (-6.8%)
Promotion ban + 50p MUP	-36366 (-8.5%)	-£4.3 (-8.5%)
Promotion ban + 55p MUP	-46024 (-10.8%)	-£5.4 (-10.8%)
Promotion ban + 60p MUP	-58084 (-13.6%)	-£6.9 (-13.7%)
Promotion ban + 65p MUP	-71204 (-16.7%)	-£8.4 (-16.7%)
Promotion ban + 70p MUP	-84799 (-19.9%)	-£10 (-19.9%)
Promotion ban + 75p MUP	-98831 (-23.2%)	-£11.7 (-23.2%)
Promotion ban + 80p MUP	-113789 (-26.7%)	-£13.5 (-26.8%)

Table 31 shows the estimated change in rates of alcohol-attributable workplace absence by drinker group for all modelled policies. These are illustrated in Figure 25, showing substantially greater impacts across all policies among higher risk drinkers.

Table 31: Modelled impacts on alcohol-attributable absence rates by drinker group

		Drinker Group		
	All Drinkers	Moderate	Increasing Risk	Higher Risk
Baseline				
Annual alcohol-attributable absences (days) per 100,000 drinkers	30,705	2,428	103,498	432,202
Policy impact				
10% price rise	−2,772	−228	−11,830	−24,349
40p MUP	−579	3	−2,396	−6,996
45p MUP	−979	12	−3,912	−12,854
50p MUP	−1,569	19	−6,103	−21,529
55p MUP	−2,318	13	−8,917	−31,959
60p MUP	−3,230	−11	−12,319	−44,285
65p MUP	−4,244	−48	−15,998	−58,278
70p MUP	−5,301	−94	−19,815	−72,801
75p MUP	−6,404	−146	−23,737	−88,178
80p MUP	−7,568	−206	−27,739	−105,026
Promotion ban	−1,190	−217	−4,617	−9,655
Promotion ban + 40p MUP	−1,764	−214	−7,006	−16,497
Promotion ban + 45p MUP	−2,111	−205	−8,355	−21,411
Promotion ban + 50p MUP	−2,620	−197	−10,275	−28,796
Promotion ban + 55p MUP	−3,315	−199	−12,905	−38,486
Promotion ban + 60p MUP	−4,184	−211	−16,155	−50,479
Promotion ban + 65p MUP	−5,129	−235	−19,558	−64,004
Promotion ban + 70p MUP	−6,109	−270	−23,111	−77,569
Promotion ban + 75p MUP	−7,120	−306	−26,664	−92,227
Promotion ban + 80p MUP	−8,197	−350	−30,287	−108,647

Figure 25: Modelled impact on alcohol-attributable workplace absence rates by drinker group



Sensitivity Analyses

The impact of using alternative price elasticities from Pryce et al. and Sousa et al. on the following key model outcomes:

- Change in mean alcohol consumption (units per drinker per year)
- Change in mean annual spending on alcohol (per drinker per year)
- Change in annual alcohol-attributable deaths (at full effect)
- Change in annual alcohol-attributable hospital admissions (at full effect)
- Change in annual alcohol-attributable hospital costs (at full effect)
- Change in annual alcohol-attributable criminal offences
- Change in the annual societal cost of alcohol-attributable crime
- Change in annual alcohol-attributable workplace days
- Change in the annual cost to the economy of alcohol-attributable workplace absence

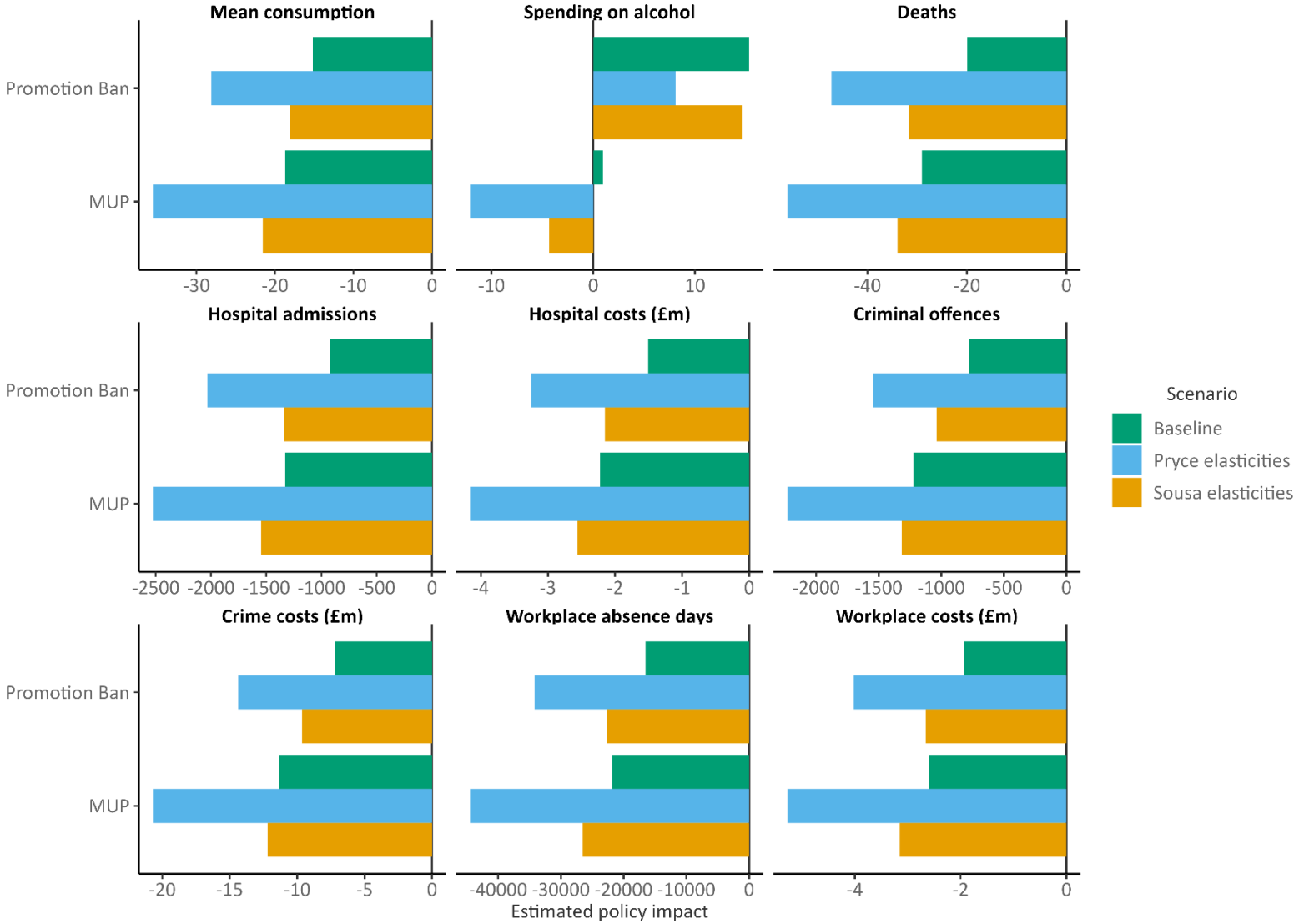
under an illustrative 50p MUP and total ban on price based off-trade promotions is shown in Table 32 and visualised in Figure 26. For both policies and all outcomes except for spending, the elasticities from Sousa et al. used by HMRC lead to slightly larger estimates of impact, while the elasticities of Pryce et al. lead to substantially larger estimates of impact – roughly double the impact of our base case. For example, under a 50p MUP we estimate alcohol consumption would fall by 18.7 units/drinker/year in our base case, compared to 21.5 units/drinker/year using the Sousa elasticities and 35.5 units/year using Pryce et al. For spending, all three sets of elasticities estimate that spending will increase under a promotion ban, although Pryce leads to a smaller increase than our base case or Sousa. In contrast to our

base case, in which overall spending increases under a 50p MUP (by 90p per drinker per year), using Sousa et al. leads to a modest reduction in spending (-£4.30 per year) while the use of elasticities from Pryce et al. leads to a larger estimate of reductions in spending (-£12.10 per year). Overall these results suggest that for almost all outcomes, our choice of price elasticities means that our model results are conservative compared to if we had used alternative elasticities from other sources.

Table 32: Change in policy impacts under alternative choices of price elasticity

	Change in outcome		
	Baseline	Pryce elasticities	Sousa elasticities
Mean consumption (units/drinker/year)			
MUP	−18.7	−35.5	−21.5
Promotion Ban	−15.2	−28.1	−18.1
Mean annual spending on alcohol			
MUP	£0.9	−£12.1	−£4.3
Promotion Ban	£15.3	£8.1	£14.6
Annual deaths (full effect)			
MUP	−29	−56	−34
Promotion Ban	−20	−47	−32
Annual hospital admissions (full effect)			
MUP	−1,327	−2,525	−1,547
Promotion Ban	−921	−2,032	−1,341
Annual hospital costs (full effect) (£m)			
MUP	−£2.2	−£4.2	−£2.6
Promotion Ban	−£1.5	−£3.3	−£2.2
Annual criminal offences			
MUP	−1,222	−2,230	−1,314
Promotion Ban	−777	−1,547	−1,037
Annual crime costs (£m)			
MUP	−£11.3	−£20.7	−£12.2
Promotion Ban	−£7.2	−£14.4	−£9.6
Annual workplace absence days			
MUP	−21,778	−44,464	−26,514
Promotion Ban	−16,519	−34,185	−22,714
Annual workplace costs (£m)			
MUP	−£2.6	−£5.3	−£3.1
Promotion Ban	−£1.9	−£4.0	−£2.7

Figure 26: Summary of the impact of alternative price elasticities on headline model outcomes for a 50p MUP and a promotion ban



Discussion

Summary of results

Overall the results from our updated Northern Irish adaptation of SAPM show that alcohol places a substantial burden on Northern Ireland across a wide range of sectors. Introducing either a Minimum Unit Price or banning price-based promotions in the off-trade would lead to reductions in alcohol consumption and alcohol-related harm, while combining the two policies would lead to greater reductions still. However, there are notable distributional differences between the two policies, with an MUP more effectively targeting heavier drinkers, while a ban on promotions has a greater impact on moderate drinkers. In general, higher MUP thresholds lead to greater reductions in consumption and harm, but are marginally less targeted than lower thresholds as they affect a greater share of the total alcohol market and so a larger proportion of the consumption of moderate drinkers. We find that alcohol harm is not equally distributed across the income spectrum, with drinkers in poverty suffering much higher rates of harm. All modelled policies are estimated to have a larger relative impact on alcohol consumption and harm among drinkers in poverty, leading to a reduction in health inequalities, however MUP policies are more effective at achieving this then banning promotions.

Comparison with previous report

The broad patterns in the results in this report are similar to the previous SAPM adaptation for Northern Ireland – for example the more effective targeting of MUP compared to a ban on promotions and the inequality-reducing impacts of alcohol pricing policies. However, the absolute magnitude of impact that we have modelled has fallen for MUP policies. In the 2014 report we estimated that a 10% price increase would reduce alcohol consumption by 5.8% compared to a 5.7% reduction in the current report. Equivalently a ban on price-based promotions was estimated to reduce consumption by 2.6% in the 2014 report compared to 2.5% in this report. In contrast, the estimated reduction of 5.7% for a 50p MUP in 2014 is now 3.2%[4]. Looking at health outcomes the effect is similar: the 2014 report estimated a 10.1% reduction in alcohol-attributable deaths for a 10% price rise compared to a 10.8% reduction in the current report; a 4.5% reduction in deaths for a ban on promotions in both reports; but the 11.3% reduction in alcohol-attributable mortality in the 2014 report has been replaced by a 6.5% reduction in the latest results.

These changes in the estimated impact of an MUP policy, but not other policies, arises from several sources. On the one hand the proportion of alcohol purchases which take place in the off-trade, where prices are generally much lower than in the on-trade, has *increased* since 2014 among heavier drinkers (e.g. 56% of higher risk drinkers' consumption was estimated to take place in the 2014 report compared to 71% in the current report). All else being equal this should make MUP policies *more* effective, as a greater proportion of alcohol is being bought at relatively lower prices. On the other hand, the latest alcohol consumption data suggests a slight shift in the consumption of the heaviest drinkers. The proportion of the population drinking within the drinking guidelines has remained stable (55% in 2014 vs. 56% in the latest data), however the low risk guidelines were changed in 2016, with the guideline for men reducing from 21 to 14 units per week [41], suggesting an overall fall in drinking. At the same time the number of people drinking at increasing risk levels has risen slightly (16% vs. 13.3% in

[4] It should be noted that a 3.2% reduction in consumption for a 50p MUP is similar to the 3.0% net reduction in alcohol sales that has been observed in Scotland following their introduction of a 50p MUP in May 2018 [40]

2014) while the number of higher risk drinkers has fallen from 5.8% to 3%. Although a reduction in baseline consumption will reduce the potential benefits of alcohol policies overall, a reduction in the number of people drinking at very high levels is likely to see a greater reduction in the impact of policies that more effective target heavier drinkers, such as MUP. The most important factor in the changing effectiveness of MUP over time, however, is the fact that while a 10% price increase and a ban on promotions are policies which have a *relative* impact on prices, the MUP threshold is an absolute value. As such the MUP threshold will be eroded over time by inflation. 50p/unit in 2013 prices (the baseline year for the 2014 report) is equivalent to less than 46p/unit in 2019 prices (the baseline year for this report) using CPI inflation[28]. As such, a 50p MUP in 2019 is not the same policy as a 50p MUP in 2014, and recent high levels of inflation since 2019 will have accelerated this erosion in the real-terms value of any specific MUP threshold.

This issue also hints at the importance of considering the longer-term view in relation to pricing policies linked to absolute values, such as an MUP threshold. Due thought should be given to the process for uprating the MUP level over time, whether that be by indexing the MUP to inflation, or periodic review of its level, assuming policy makers do not wish for the effectiveness of the policy at reducing alcohol consumption and harm to wane over time.

Strengths and limitations

This analysis represents the most comprehensive estimates to date of the potential short- and long-term impacts of introducing alcohol pricing policies in Northern Ireland. The modelling synthesises a wide range of data on alcohol consumption, spending and harm alongside international research evidence on the associations between alcohol consumption and harm. The Sheffield Alcohol Policy Model has been used extensively, both within the UK and internationally, to inform decisions around alcohol pricing policies and their potential effect and analyses using SAPM have been published widely in leading scientific journals. Many of the assumptions within SAPM are conservative, as illustrated by the Sensitivity Analyses using alternative price elasticity estimates, which lead to larger estimates than the base case used throughout this report.

As with any model there are limitations alongside which the results of this analysis should be considered. These have been discussed at length elsewhere (e.g. [5,42,43]), however, there are several limitations which are of particular relevance to the context in this report. Firstly, dependent drinkers are a complex population, with specific needs, who are generally underrepresented in much of the descriptive and epidemiological data used in SAPM and as such the model is unlikely to reflect the full impact of any policy on this group. The introduction of pricing policies, particularly ones that affect the prices of the cheapest alcohol such as MUP, may lead to diverse impacts, both positive and negative, within this group. Recent evidence from Scotland found very limited evidence to support significant negative impacts on dependent drinkers following the implementation of MUP [44], however additional support may be advisable for this population alongside the introduction of such policies.

Secondly, we have not modelled either unrecorded alcohol (an umbrella term covering illicit imports and home-produced alcohol) or cross-border alcohol purchases. On the former issue, unrecorded alcohol consumption is estimated to be relatively low within Northern Ireland, and international evidence suggests that even the presence of much higher levels of unrecorded consumption does not negative the beneficial impacts of alcohol pricing policies [45,46]. On the latter point, a recent evaluation of the Scottish experience found little impact of cross-border purchasing following the introduction of MUP [47]. Further, as the Republic of Ireland has a MUP in place already, set at €1 per Irish standard drink, equivalent to approximately 70p per unit at based on the exchange rate at the time of writing, significant cross-border purchases, either

into or out of Northern Ireland seem unlikely if an MUP of a relatively similar magnitude were introduced.

Thirdly, as mentioned in the methods section, we have not attempted to model the impact of the pandemic either on alcohol consumption, or on public health. The figures presented in this report represent an appraisal of the potential impact of the 20 modelled policies, had they been introduced in 2019 and the COVID pandemic had not happened. Data on changes in alcohol consumption during the pandemic in Northern Ireland is limited, and although alcohol-specific mortality has risen, this increase is less pronounced than in other parts of the United Kingdom. It also remains unclear to what extent, if any, pandemic-era changes in drinking will persist into the future. However, the consequences of not modelling the pandemic for the validity of the results presented in this report to the current policy situation are likely to be extremely limited. This is because SAPM operates on a ceteris paribus, or 'all else being equal' basis. This means that we assume that alcohol consumption in the population remains constant (after accounting for changes in the age composition of the population over time) in the absence of any policy intervention. We do not, therefore, attempt to model longer-term trends in alcohol consumption or other related factors, such as the decline in rates of cardiovascular disease. However, the effect that these underlying trends, or other 'shocks' such as the pandemic, is likely to be small, as we are examining the difference between 2 modelled scenarios and the effects on model results of any unaccounted-for trends are likely to be similar in both scenarios. As such, even if the data were available to populate a version of SAPM with a baseline year of 2023, it is likely that the results would be comparable with the results presented in this report.

Finally, it is important, when interpreting the results in this report, to recognise that we have only modelled the impact of alcohol consumption on the drinker themselves. These direct harms do not include a wide range of harm that other people may experience as a result of an individual's drinking.[48] For example, we have not attempted to model the impacts of alcohol consumption on domestic violence, public nuisance, drink driving or Foetal Alcohol Spectrum Disorders. As a result, both our estimates of the current burden that alcohol places on Northern Irish society, and the potential impact of alcohol policies to reduce that harm, are likely to be underestimates of the true figure once these harms to others are taken into account.

Conclusions

Alcohol consumption places a significant burden on public health, the criminal justice system and the wider economy in Northern Ireland. Alcohol pricing policies such as Minimum Unit Pricing or a ban on off-trade price-based promotions have the potential to significantly reduce this burden, while also contributing to a reduction in the significant alcohol-related health inequalities that exist currently.

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