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Impact of minimum price per unit of alcohol on patients with liver disease in UK

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ABSTRACT

The slow epidemic of liver disease in the UK over the last 30 years is a result of increased consumption of strong cheap alcohol. When we examined alcohol consumption in 404 subjects with a range of liver disease, we confirmed that patients with alcohol-related cirrhosis drank huge amounts of cheap alcohol, with a mean weekly consumption of 146 units in men and 142 in women at a median price of 33p/unit compared with £1.10 for low-risk drinkers. For the patients in our study, the impact of a minimum unit price of 50p/unit on spending on alcohol would be 200 times higher for patients with liver disease who were drinking at harmful levels than for low-risk drinkers. As a health policy, a minimum unit price for alcohol is exquisitely targeted at the heaviest drinkers, for whom the impact of alcohol-related illness is most devastating.

KEYWORDS: alcohol, alcohol policy, cirrhosis, liver, minimum unit price

Introduction

Over the past 30 years, the UK has seen a fourfold increase in mortality due to liver disease, with most of these deaths resulting from alcohol-related liver disease (ALD).[1] Alcohol-related liver disease comprised around 4% of the 1.2 million alcohol-related admissions in England but caused 84% of the 6,923 deaths directly attributable to alcohol and, as such, is a major contributor to alcohol-related harm. Liver disease is the third leading cause of years of working life lost in England and Wales,[2] with the vast majority of these premature deaths being related to alcohol.[3]

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In the alcohol strategy[4] published in March 2012, the government in the UK outlined the underlying reasons for this increase in alcohol-related harm. They cited cheap alcohol and a failure of previous governments to tackle the issue as the main factors. They noted the 'strong and consistent evidence that an increase in the price of alcohol reduces the demand for alcohol which in turn can lead to a reduction in harm, including for those who regularly drink heavily and young drinkers under 18's' and proposed a minimum unit price (MUP) for alcohol, with a consultation not on the principle of the legislation but on the level of the MUP. Modelling was used to provide estimates of the impact of an MUP set at various levels, with an MUP of 50p estimated to prevent about 1,000 deaths in England.[5]

Evidence shows that very heavy drinkers seek out the cheapest possible alcohol but still spend a considerable proportion of their limited incomes on alcohol.[6,7] As a result, an MUP is likely to impact on high-risk drinkers out of all proportion to the impact on low-risk drinkers. To test this hypothesis, we questioned patients by using a detailed drinking diary asking about the type of alcohol they drink, where they buy it and how much they pay for it, so that we could calculate the financial impact of MUP on heavy harmful drinkers with alcohol-related liver disease in a clinical setting.

Methods

The study was performed in the liver unit of a large teaching hospital in the South of England. The hospital does not have a liver transplant unit and, although some tertiary referral cases are seen, most of the workload is local and represents a normal liver workload for a hospital.

Recruited subjects were selected at random from consecutive new attendances at liver outpatient clinics and inpatient admissions. The study was performed in two cohorts by trained 4th year medical students using validated alcohol assessment tools, as previously reported.[8] The main study cohort (n=204 in final analysis) was recruited from 16 December 2012 to 1 April 2013 (excluding weekends and university holidays), when undergraduate student researchers were available to attend clinics and liver wards. Researchers had no knowledge of the underlying liver diagnosis before they approached patients. Informed consent was obtained, and patients who had never drunk alcohol were asked no further questions about their drinking but were included in the study. Patients were given the choice of being interviewed face to

face or completing a written questionnaire comprising the validated alcohol assessment tools AUDIT[9] and Retrospective Drinking Diary (RDD)[10]. Patients were also asked additional questions adapted from the ONS Living Costs and Food Survey (LCF)[11] and further additional questions, including 'How much do you spend on alcohol per week?'. Patients were given the opportunity to give their income as an exact figure or within a range, with the mean income within each range used in subsequent analysis when the exact figure was not stated; 60/204 (29.4%) patients were not prepared to state their income in either format and were therefore excluded from income calculations.

Patients in the second cohort (n=200) had previously been recruited between 8 October 2007 and 17 March 2008. Detailed data from drinking diaries for these patients, which have previously been used to report patterns of drinking,[12] were incorporated, where appropriate. The methods for this additional cohort were identical to those for the major cohort, except that they had not been asked questions about expenditure on alcohol.

The study thus comprised drinking diary information in 404 subjects, 204 of whom also recorded their expenditure on alcohol.

Data analysis and presentation

The purpose of the study was to determine how much very heavy drinkers spend on alcohol in relation to their income and not to compare drinking levels between ALD and other types of liver disease, which has been reported previously.[8] Patients were classified into the drinking grades used by the Office of National Statistics for England and Wales[2] and the Sheffield Alcohol Policy Model.[5] With one unit of alcohol in the UK equal to one centilitre (cl) of pure alcohol, the grades were: moderate or low risk (0–14 cl and 0–21 cl alcohol/week for women and men, respectively), hazardous (15–34 cl and 22-49 cl alcohol/week) and harmful (≥35 and ≥50 cl alcohol/week). No significant differences were seen between the two cohorts in alcohol consumption within drinking categories (data not shown) and the type of alcohol purchased, so data were combined in subsequent analyses. It was possible to calculate expenditure on alcohol according to a typical price and the cheapest possible price in all subjects, but only patients in the second cohort were asked about their income or how much money they spent on alcohol each week, and only this data was used to model the impact of MUP set at 50p/cl (UK unit). To validate this data we also calculated expenditure using the drinking diary. Students visited supermarkets, local shops and pubs in Southampton in March 2013 to ascertain typical 'average prices' and typical 'lowest possible prices' for a range of different types of alcoholic beverage bought as either 'on-sales' (bars and pubs) or 'off-sales' (alcohol to take away from supermarkets and shops). This information was used to calculate average and lowest possible costs for alcohol, which was correlated with the results of the drinking diary as a health check for the data on price/unit calculated from the drinking diary and the question on typical weekly expenditure on alcohol.

Data was entered into an encrypted SPSS database. The amount spent per unit of alcohol, the additional weekly spend with an MUP of 50p and the percentage of annual income spent on alcohol were calculated for each participant, as follows:

- Amount spent per unit of alcohol = weekly alcohol expenditure/weekly units
- Additional weekly spend for an MUP of 50p = (0.50 – price per unit) × weekly units
- Proportion of annual income spent on alcohol = (weekly spend × 52) ÷ annual income.

Data on alcohol consumption are not normally distributed, but levels of drinking at the heavy end of the spectrum are of great importance. The Office for National Statistics and the Health and Social Care Centre report mean values for alcohol consumption,[13] and mean consumption values are used in the Sheffield Alcohol Policy Model.[14] We present consumption and derived data using mean, 95% confidence intervals (CIs), median, interquartile range (IQR) and categorised data, as appropriate. Data were analysed using SPSS software version 20, with non-parametric tests of significance including chi-squared, Spearman correlations and Mann–Whitney U tests.

Results

The harmful category of heaviest drinkers drank a mean of 145 cl alcohol/week (95% CI 141 to 170, median 112 cl). Within drinking categories, there were no gender differences in overall alcohol consumed (Table 1), so data for the sexes were combined for subsequent analyses. There were significant differences between risk groups in terms of preferred drink, with a significant preference for spirits ($p=0.002$) and cider ($p<0.001$) among harmful drinkers. In terms of the proportion of units consumed, cider comprised 17.4% and 5.7% of harmful and low-risk units, respectively, and spirits 32.5% and 14.2%, increases of threefold and twofold respectively (Fig 1). Of all of the units of alcohol consumed by all subjects, harmful drinkers consumed 94% of cider units, 90% of spirit units, 81% of lager/beer units and 68% of wine units. For harmful drinkers, 80% of alcohol consumed was bought to consume at home, with roughly equal proportions coming from supermarkets, local shops and off-licences.

We made two separate assessments of expenditure on alcohol. We asked participants to tell us the amount they spent on alcohol each week, and we validated this information against information from the drinking diary – separating alcohol bought to consume at home from alcohol purchased in a pub or bar, where prices are substantially higher. We then estimated weekly expenditure using two sets of prices obtained by visiting local supermarkets, off-licences and pubs and noting the typical average prices for 'on-sales' and 'off-sales' for each type of alcoholic beverage, together with the cheapest possible price that we could find in the same retail outlets (Table 2). Median levels of expenditure between reported and calculated weekly spend were similar to average prices in low risk drinkers: median £6.00 (IQR £8) and £5.60 (IQR £8), respectively, for low-risk drinkers and £19 (15) and £18.10 (IQR 8), respectively, for hazardous drinkers. For harmful drinkers, reported median spend was similar to the calculation using the cheapest possible prices: £50 (IQR 75) and £53 (IQR 99),

Table 1. Demographics and alcohol consumption.

Demographic	Gender-based drinking grades				Total
	No alcohol in a typical week	Low risk	Hazardous	Harmful	
Sex (n, %)	122 (100)	152 (100)	46 (100)	84 (100)	404
Male (n, %)	44 (36)	85 (56)	30 (65)	61 (73)	220
Female (n, %)	78 (64)	67 (44)	16 (35)	23 (27)	184
Aetiology of liver disease					
Alcohol	21	39	26	66	–
Mixed	9	17	20	18	–
Other	92	96	0	0	–
Mean age (years)	54	54	50	49	–
Mean (95% CI) alcohol consumption (cl/week)					
Men		8 (7 to 10)	32 (28-35)	146 (123 to 170)	–
Women		6 (5 to 7)	23 (20-26)	142 (74 to 209)	–
At home (cl/week)		5 (4 to 6)	20 (16 to 24)	116 (91 to 142)	–
Outside home (cl/week)		2 (1 to 3)	8 (4 to 11)	29 (14 to 44)	–
Total alcohol consumption (cl/week)		7 (6 to 8)	28 (26 to 31)	145 (121 to 170)	–
Median (IQR) total alcohol consumption (cl/week)		6 (7)	27 (9)	112 (95)	–

CI = confidence interval; IQR = interquartile range.
Drinking grades based on those used by Office of National Statistics: moderate or low risk (0–14 cl and 0–21 cl alcohol/week for women and men, respectively), hazardous (15–34 cl and 22–49 cl alcohol/week) and harmful (≥35 and ≥50 cl alcohol/week). Within these categories, there were no significant gender differences between the amount of alcohol consumed, so data were combined. Data are not structured so as to be able to compare drinking levels between alcohol-related liver disease (ALD) and other types of liver disease; the alcohol consumption in low-risk and hazardous drinking patients with ALD does not reflect lifetime drinking patterns, which have been reported for some of this cohort previously.[8]

respectively. The Spearman rho correlations for reported and calculated levels of expenditure were 0.63 for average price and 0.7 for cheap price for low-risk drinkers, 0.48 and 0.50 for hazardous drinkers and 0.63 and 0.58 for harmful drinkers ($p<0.001$).

These data suggest that levels of reported alcohol expenditure were realistic compared with expenditure calculated from the drinking diary (Fig 2) and confirm our hypothesis that most patients with liver disease who drink at harmful levels tend to consume the cheapest possible alcohol, with 75% paying ≤50p/cl per unit and a median price of £0.33/cl per unit compared with a median of £1.10/cl per unit for low-risk drinkers. The projected impact of an MUP of 50p on weekly expenditure varied enormously according to the level of alcohol consumption, with a more than 200-fold difference between harmful (£33.40/week) and low-risk drinkers (14p/week, see Fig 2). We found that 89% of low-risk drinkers would not be impacted at all by an MUP of 50p/unit, with 6% paying up to an additional £1/week and 5% up to £5 (Table 3).

We split our subjects into two income cohorts using a cut off at £20,000 year in order to model the differential impact of a 50p MUP. There was a higher impact on low-income hazardous drinkers, with more than 50% paying up to an additional £5/week (chi-squared $p=0.03$), but the impact on low-risk ($p=0.19$) and harmful drinkers ($p=0.43$) did not differ according to income (Fig 3).

As a proportion of annual income, the additional cost of an MUP of 50p would be around £4/year, which is 0.03% of the annual income for our patients drinking at low-risk levels, whereas the additional cost for harmful drinkers would be a mean of £1,500/year, or 13% of annual income (a 400-fold difference), with 45% of harmful drinkers paying more than an additional £1,000/year were they to maintain their previous level of alcohol consumption.

Discussion

We found that an MUP of 50p/unit impacted most severely on harmful heavy drinkers, who, on average, would have to pay an additional £1,500/year, or 13% of their income, compared with £4/year, or 0.03% of income, for low-risk drinkers. The vast majority of low risk drinkers (89%) would pay nothing extra at all. The reasons for the hugely disproportionate impact are that the majority of patients with alcohol-related cirrhosis have extremely high alcohol consumptions and, as a result, have graduated to the cheapest alcohol it is possible to buy. Although liver- and alcohol-related mortality are strongly associated

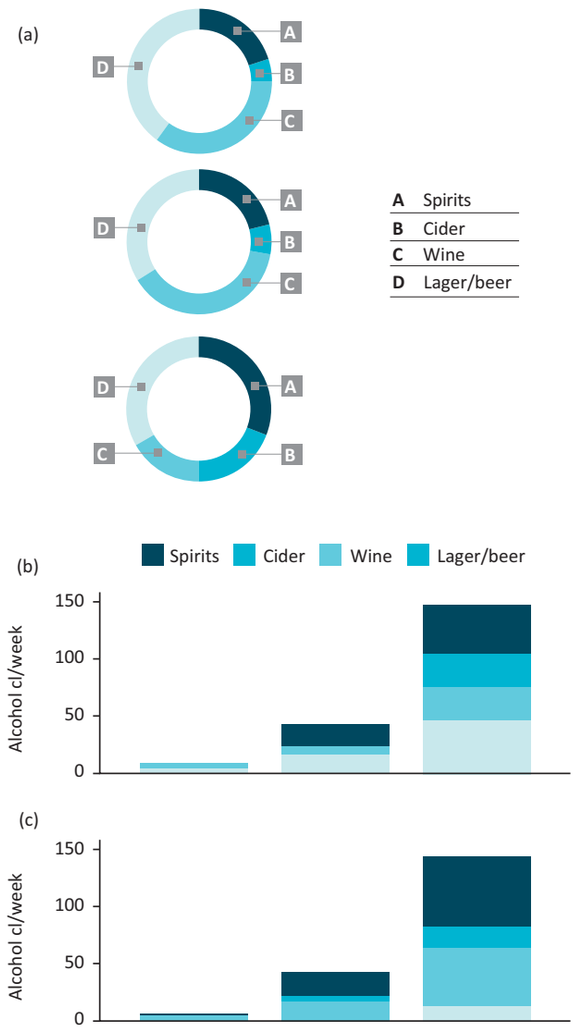

Fig 1. Preferences for different types of alcoholic beverage vary between low-risk and harmful drinkers in (a) xxx (b) males and (c) females. As a proportion of alcohol consumed, harmful drinkers drank twice as much alcohol as spirits (p=0.002) and three times as much alcohol as cider (p<0.001) compared with low-risk drinkers. The proportion of alcohol drunk as wine was reduced in harmful drinkers (p<0.001), although women drinking at harmful levels consumed equivalent proportions of their alcohol intake as wine (30%) and spirits (30%).

with low income and deprivation,[15,16] there were no significant differences in income between drinking categories in our study, and differences in income cannot be implicated as the reason for the hugely disproportionate impacts.

The levels of alcohol consumption in our low-risk (mean 7 vs 5.5 units) and moderate drinking (mean 28 vs 27.2 units) subjects were broadly similar to consumption data from the general lifestyle survey used in the Sheffield Alcohol Policy Model,[17] whereas alcohol consumption in patients with liver disease drinking at harmful levels was very much higher (mean 146 vs 71.4 units). This very high alcohol consumption is entirely consistent with previous studies. We have previously reported a mean of 114 cl alcohol/week in patients with alcohol-related cirrhosis.[8] A French study found a mean consumption of 165 cl/week in patients with cirrhosis and 248 cl/week in patients with alcohol dependence but no cirrhosis.[18] Similarly, Scottish patients with alcohol dependency had higher levels of alcohol consumption than our patients with liver disease, with a mean of 198 cl/week (95% CI 184 to 210).[6] Given the tight relationship between liver fibrosis/cirrhosis and alcohol consumption,[19] it may seem counterintuitive that alcohol-dependent patients without liver disease drink more than patients with alcohol-related cirrhosis. However, genetic cofactors mean that only about 20–30% of lifelong alcoholics develop liver fibrosis and cirrhosis,[20,21] and the very heavy drinkers in these studies escape cirrhosis by virtue of their genes rather than their lifestyle. About 80% of the deaths directly attributable to liver disease are from alcohol-related liver disease,[3,22] and a further 10% result from alcohol dependency, so the drinking behaviours of these two groups are absolutely critical to the accurate modelling of fiscal policies, including MUP.

Studies of alcohol consumption are reliant on retrospective self-reported data.[23] In addition, we relied on subjects to tell us accurately how much they spend on alcohol each week, although we were able to validate this data to some extent against calculations based on a drinking diary. Our data confirm that patients with liver disease who drink at harmful levels consume very cheap alcohol – a median of 33p/cl compared with the cheapest alcohol, which was 29p/cl for 7.5% alcohol by volume (ABV) cider. We also found that harmful drinkers drank a much higher proportion of their alcohol as strong cider and spirits (usually vodka) than low-risk drinkers. We are aware of one previous study that examined the price paid for alcohol in very heavy drinkers in an alcohol dependency unit in Edinburgh, with the median price/cl for off-sales being 33p in 2008, but the study did not record incomes.[6] Similarly, in the US National Alcohol Survey, the decile of heaviest consumers paid $0.79/drink compared with $4.57 for the lower five deciles combined.[7] The latter study also demonstrated that the Pareto principle, or 80:20 rule,[24] applies to alcohol purchases; despite buying cheap alcohol, the 10% heaviest consumers accounted for 33% of expenditure overall. Similar to our findings that spirits (and strong cider) were preferentially consumed by harmful drinkers, 63% of spirits sales in the American study were purchased by the heaviest drinking decile.[7] The Pareto principle also applies to the alcohol market in the UK; in the 2008 Alcohol Strategy consultation, the Department of Health stated that hazardous and harmful drinkers were responsible for 75% of alcohol consumption in the UK – a powerful motive for the drinks industry to oppose targeted polices to reduce harmful drinking and liver deaths.[25]

The Sheffield Alcohol Policy Model[17] predicts that an MUP delivers a greater reduction in alcohol-related harm than overall increases in taxation, with almost double the number of deaths prevented.[26] Further evidence for the effectiveness of an MUP comes from long-running natural experiments in Canada, where significant reductions in alcohol consumption followed increases in minimum

Table 2. Calculated and reported weekly expenditure on alcohol.

Expenditure	Low risk	Hazardous	Harmful	n
Calculated weekly spend (£)				
Typical				
Mean (95% CI)	7.2 (5.7to 8.6)	21 (14 to 30)	137 (81 to 193)	404
Median (IQR)	5.6 (8)	18.1 (8)	87 (105)	
Cheapest				
Mean (95% CI)	5.5 (4.2 to 6.8)	15 (8 to 23)	98 (52 to 144)	404
Median (IQR)	3.6 (6)	15.6 (7)	53 (99)	
Reported weekly spend (£)				
Mean (95% CI)	9.5 (7.5 to 11)	22.5 (11 to 34)	66 (47 to 86)	204
Median (IQR)	6 (8)	19 (15)	50 (75)	
Price per unit (cl alcohol)				
Mean (95% CI)	1.6 (1.2 to 1.9)	0.8 (0.5 to 1.1)	0.49 (0.34 to 0.64)	204
Median (IQR)	1.1 (1.3)	0.77 (0.56)	0.33 (0.3)	
Mean (95% CI) annual income (£1,000)	22.9 (18.6 to 27.1)	23.4 (14.1 to 32.7)	22.7 (13.5 to 32.0)	144
Mean (95% CI) alcohol spend as % of income (%)	3.2 (2.2 to 4.0)	4.7 (2.7 to 6.7)	26.4 (13.5 to 39.3)	144
Mean (95% CI) impact of MUP at 50p (£)	0.14 (0.3 to 0.24)	1.3 (0.18 to 2.4)	33.4 (14.1 to 52.8)	204
Mean (95% CI) impact as % of income (%)	0.03 (0.002 to 0.06)	0.3 (0.01 to 0.6)	12.5 (1.0 to 23.3)	144

CI = confidence interval; IQR = interquartile range; MUP = minimum unit price.
Reported weekly spend on alcohol for low risk and hazardous drinkers was very close to the typical average supermarket prices, whereas for harmful drinkers it was much closer to the cheapest possible price that alcohol was sold in local supermarkets. The vast majority of low-risk and many hazardous drinkers would suffer no impact from a minimum unit price set at 50p/unit; median values would misrepresent the distribution, so mean values are presented and data are categorised here and in Fig 2.

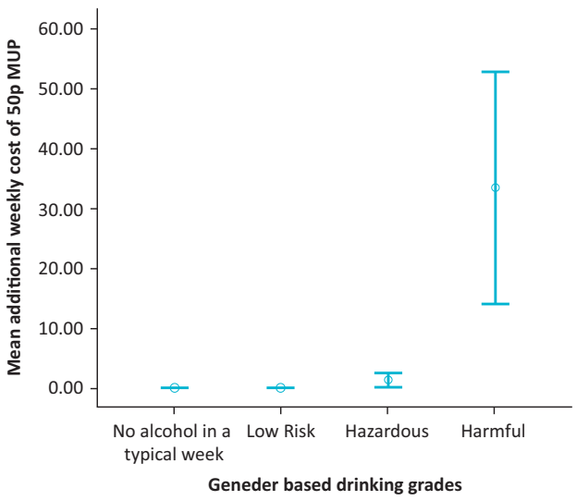

Fig 2. Mean (95% confidence interval; p<0.001) additional cost of a minimum unit price (MUP) of 50p for alcohol according to category of drinking grade. With knowledge of the amount of alcohol consumed and the price paid per unit for each subject, we were able to estimate the additional cost for each category of drinker should an MUP of 50p/unit be imposed. Most low-risk and hazardous drinkers would be unaffected by an MUP of 50p/unit, and there is a massively disproportionate impact of more than 200-fold on harmful drinkers with liver disease compared with low-risk drinkers.

prices in government liquor stores, despite these outlets representing only a minority of the retail market,[27,28] with a 10% increase in minimum price resulting in a 32% fall in deaths directly attributable to alcohol.[29] Our data suggest that the Sheffield model is likely to underestimate the impact of an MUP on liver-related mortality. The mean intake of 144 cl alcohol/week in our harmful drinking patients with liver disease compares with a mean of 71.4 units for the harmful category of drinkers from the General Lifestyle Survey (2009)[30] used in the Sheffield model. We had hoped that the Sheffield group would be prepared to re-run a further sensitivity analysis using clinically relevant alcohol consumption data to confirm our hypothesis of an increased impact on liver mortality; although they had yet to run the analysis at the time of submission, John Holmes agreed that 'data on real consumption in ALD patients is relevant to underlying assumptions made for the model, the implications are complex, however, and would require further detailed analysis to make any firm conclusions'. The Sheffield group subsequently confirmed the increased impact of MUP on harmful drinkers who 'purchase more alcohol at less than the minimum price'.[17]

The drinks industry present a paradox – they claim to support policies that target heavy drinkers[31] but are fiercely opposed to an MUP, even though it is exquisitely targeted at the very heaviest consumers. The Scotch Whisky Association state on

Table 3. Impact of a minimum unit price of 50p for alcohol, categorised according to drinking grade (%).

Impact of MUP of 50p (£/week)	Number (%) of people per drinking grade				Total
	No alcohol in typical week	Low risk	Hazardous	Harmful	
0	74 (100)	73 (89)	11 (65)	8 (26)	166
0.01–1	0	5 (6)	0	1 (3)	6
1.01–5	0	4 (5)	4 (24)	1 (3)	9
5.01–9.99	0	0	2 (12)	4 (13)	6
10.01–19.99	0	0	0	3 (10)	3
≥20	0	0	0	14 (45)	14
Total	74 (100)	82 (100)	17 (100)	31 (100)	204

MUP = minium unit price.
The impact of an MUP of 50p is heavily skewed towards harmful drinkers, with about 90% of low-risk drinkers completely unaffected.

their website, 'Minimum unit pricing will punish responsible consumers with higher prices. A 40p minimum unit price will impact only on the bottom 30% of households by income group – hitting the poor hardest and will do nothing to address the causes of alcohol mis-use',[32] a statement that is not supported by the facts. However, a further statement from the Scotch Whisky Association may contain a grain of truth: 'Distillers believe minimum pricing, as proposed by the Scottish Government, would have little impact on alcohol harm but would violate EU and international trade rules, leading to copycat trade barriers in export markets'.[33]

Clearly, an ineffective policy is not going to be taken up elsewhere, but if an MUP proves to be as effective as the evidence suggests, it will be adopted by other countries; Ireland, Switzerland, Wales and Poland are currently in various stages of the process. In Scotland, the MUP bill was a manifesto commitment overwhelmingly supported by the electorate, approved by parliament and given the Queen's ascent but is now stalled by legal challenges from the spirits industries, which under the circumstances are profoundly undemocratic.[34] Rather than opposing evidence-based health policies, a better solution for drinks industry shareholders might be to develop less lethal business models. This has happened in France, where the wine trade has shifted from selling cheap 'plonk' in high volumes to higher quality regional wines, which has resulted in increased profits despite reductions in population-level alcohol consumption and a dramatic decrease in deaths from liver disease.[1] ■

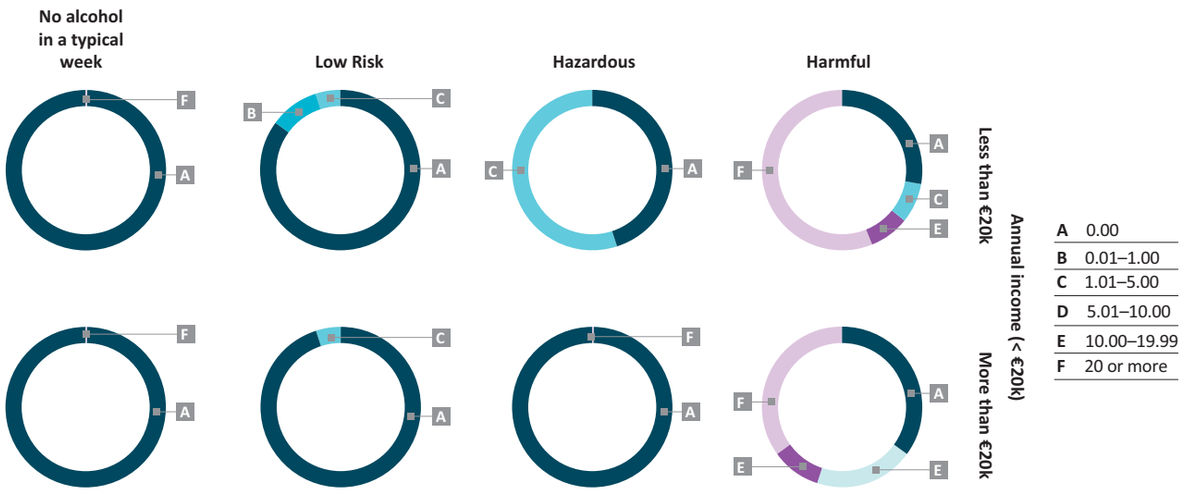

Fig 3. Additional weekly cost of a minimum unit price (MUP) of 50p for alcohol categorised by risk category and income. Impact of an MUP of 50p is categorised: low-risk patients are almost entirely unaffected; some hazardous drinkers would pay up to an additional £5/week, with more impact on lower income drinkers; and there is a disproportionate impact on harmful drinkers irrespective of income, with many of the very heavy drinkers paying more than £20/week extra.

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AUTHOR QUERIES

Title: Impact of minimum price per unit of alcohol on patients with liver disease in UK
Authors: Nick Sheron, Fern Chilcott, Laura Matthews, Ben Challoner, Maria Thomas

Section, para	Query
Right strap	Please confirm that you are happy with the short title
Address for correspondence	Please provide full mailing address for correspondence, including street address and postcode
Column info	Please provide job titles for all authors
Introduction	Please provide year for the sentence "Alcohol-related liver disease comprised around 4% of the 1.2 million alcohol-related admissions in England but caused 84% of the 6,923 deaths directly attributable to alcohol and, as such, is a major contributor to alcohol-related harm"
Methods and Participants	These sections have been combined to improve flow, as the methods in the two cohorts were discussed before the cohorts were described.
Methods and participants and Data analysis and presentation	However, the differing terminology used (major cohort, second cohort, previous cohort) made it difficult to know which cohort did and did not answer questions about expenditure. For example, the Methods section states that the first cohort (n=204) and not the second cohort (n=200) was asked questions about expenditure, while Data analysis and presentation states that only the second cohort was asked about expenditure. Please check that the revised wording has interpreted this correctly and use one consistent term throughout to ensure clarity
Data analysis and presentation/para 1/line 17	Please check the wording in the following sentence and reword to clarify: > This information was used to calculate average and lowest possible costs for alcohol, which was correlated with the results of the drinking diary as a health check for the data on price/unit calculated from the drinking diary and the question on typical weekly expenditure on alcohol.
Results	In the following sentences, to what comparators do the threefold and twofold differences refer? > In terms of the proportion of units consumed, cider comprised 17.4% and 5.7% of harmful and low-risk units, respectively, and spirits 32.5% and 14.2%, increases of threefold and twofold respectively (Fig 1).
Discussion/para 1/sentence 1	The first sentence of the discussion repeats almost work for word the last sentence of the results section immediately before. Please consider rewording to avoid this direct repetition
Discussion/para 2/sentence 1	To what do comparators do the mean values in brackets throughout this sentence refer? > The levels of alcohol consumption in our low-risk (mean 7 v 5.5 units) and moderate drinking (mean 28 v 27.2 units) subjects were broadly similar to consumption data from the general lifestyle survey used in the Sheffield Alcohol Policy Model,17 whereas alcohol consumption in patients with liver disease drinking at harmful levels was very much higher (mean 146 v 71.4 units).
Ref 3	Please provide alternate URL as original one is no longer active
Fig 1	Please provide titles for (a), (b) and (c).
Fig 3	I have changed "5.01 to 9.99" to "5.01–10.00" as there seemed to be no option for 10.00. Please confirm this is correct or amend as necessary.