Effect of policy, economics, and the changing alcohol marketplace on alcohol related deaths in England and Wales

The economic downturn and rises in alcohol taxation seem to have stemmed the persistent rise in alcohol related deaths in England and Wales, but Nick Sheron and Ian Gilmore caution that changes to fiscal policy could see mortality increase once more.

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The population consumption theory links population level alcohol consumption to alcohol related harm, forming a theoretical basis for modern alcohol control policy. As the late Professor Griffith Edwards stated, other things being equal, “the overall level of a population’s drinking is significantly related to the level of alcohol related problems which that population will experience.” The factors that drive alcohol consumption apply to harmful drinkers as well as low risk drinkers, and alcohol related harm is dose related, at both individual and population levels.

According to HMRC duty and tax receipts, UK alcohol sales increased from around 400 million litres in the early 1980s, peaking at 567 million litres in 2008, an increase of around 42%, since when they have declined (fig 1). During this time alcohol related deaths in England and Wales tripled from 2314 in 1980, to 7312 by 2008, with most deaths being liver related (fig 2). The way alcohol is sold and the types of alcohol consumed have also changed over this period.

Patterns of consumption are known to be related to price. Mathematical coefficients, termed “elasticities,” linking the consumption of alcohol to price and taxation are used by the Treasury to model fiscal policy and by the drinks industry to lobby the Treasury. Further coefficients link alcohol related mortality and morbidity to consumption and price, and are central to the modelling of alcohol policy by the Organisation for Economic Cooperation and Development (OECD), World Health Organization, and the UK government.

The population consumption theory suggests that alcohol related deaths have increased as a direct result of an increase in alcohol consumption. We examine whether the changes in population level alcohol consumption and the trends in alcohol related deaths over the past few decades are consistent with the population consumption theory.

Economic cost of alcohol

The most recent systematic review quoted by the OECD estimated the economic cost for alcohol at 2.6% of gross domestic product (GDP) in high income countries. This equates to £50bn ($62bn; $71bn) a year in the UK. In 2004 the UK government estimated a cost of £20bn (1.3% of GDP), and the true value probably lies somewhere between the two estimates. Excise duties brought an income of £10.5bn in 2014-15 and there were 29.7 million taxpayers, giving an estimated net overall cost for alcohol related harm to each UK taxpayer of between £9 and £25 each week.

Changing nature of UK drinks industry

In marketing terminology sales of any product are driven by the four Ps—place, product, promotion, and price—and all these factors have changed considerably. Numbers of on-sales (pubs, etc) licences increased from 131 000 in 1980, to 148 000 in 2012; off licences increased from 42 000 to 56 000 and consumption shifted from pubs to alcohol bought to be consumed at home. The nature of the product changed as sales of weaker draught beers decreased and sales of strong lager and cider increased. Furthermore, as a wartime generation of whisky drinkers passed away, the spirits industry shifted its target demographic to a younger audience, introducing “alcopops.” Consumption of spirits and alcopops by children aged 10-15 increased fourfold, followed a few years later by a huge increase in sales of vodka and related spirits (fig 3). Wine consumption also rose as a result of cultural globalisation and the increased marketing and availability as supermarkets became the major alcohol retailers. Overall, the trends in alcohol related deaths coincide with trends in consumption of cider, wine, and to some extent white spirits and strong lager, and are consistent with the population consumption theory (fig 4).
Who drinks the alcohol—the Pareto principle

The corporate global drinks industry likes to frame alcohol related harm as a minority problem affecting a small group of “alcoholics” who are unable to control their drinking. The population consumption trend represents an inconvenient truth and on the whole the industry refuses to accept the evidence that links price to consumption and harm. But another economic fundamental is relevant to the alcohol marketplace—the Pareto principle or 80:20 rule, which states that 20% of highest consumers consume around 80% of any product. Combined data from the 2011-13 Health Surveys for England show how the principle applies to the alcohol market (table 1). Harmful and extreme drinkers comprise a tiny minority, 4.4% of the population, but consume one third of all alcohol sold; the combination of hazardous, harmful, and extreme drinkers provides almost 70% of drinks industry sales by volume. The drinks industry uses its influence on government to protect this market. This has brought about remarkable changes in affordability—as the ‘90s economy boomed and wages increased, taxation of alcohol was reduced in real terms. By 2008 it was possible to buy almost four bottles of vodka for the price of one bottle in 1980—and four bottles represents the weekly alcohol consumption of an average patient presenting with alcohol related liver cirrhosis. As the affordability of stronger alcohol increased, so did liver and related mortality (fig 5). Coincident trends cannot prove a causal link between alcohol affordability, consumption, and mortality, but they are entirely consistent with the consumption theory and suggest how the epidemic of alcohol related harm is likely to have come about. There is a wealth of other evidence for such a causal relation—most recently brought together by the 2015 OECD report. It also seems likely that the shift to stronger alcohol favoured by heavy drinkers may have amplified the effect on mortality. Most governments recognise this and tax alcohol differentially, with higher tax levies for stronger alcohol. Specific drinks preferences are strongly linked to culture, drinking patterns, and other confounders, and international evidence provides no clear verdict on the link between stronger alcohol and harmful consequences.

Changing economic environment and peak in alcohol related deaths

The Lancet Liver Commission identified alcohol consumption as the main factor behind the increase in liver disease mortality and set a goal to bring deaths back down to 1980s levels by 2030. If the ongoing year on year increase in alcohol related deaths had continued, linear extrapolation of the trend suggests there would have been 11 400 deaths a year by 2030, with a cumulative total of 150 000 deaths from 2016 onwards. But alcohol related deaths peaked in 2008 (fig 5), and if current patterns continue there may be around 50 000 fewer deaths than expected. The inflexion in deaths and subsequent levelling off coincided with the banking collapse and worldwide economic recession, and this together with the new mood of austerity may have affected drinking behaviours. Another potentially important factor was a 2% above inflation escalator in alcohol duty introduced by the Treasury in 2008. This policy went largely unnoticed by the general public, perhaps because budgets have generally been associated with increases in duty on cigarettes and alcohol. The escalator survived a change in government and the economic downturn and has had a substantial effect on the affordability of alcohol. From 2007-08 onwards the affordability of wine fell by 54%, spirits 50%, cider 27%, and beer 22%, whereas household incomes fell by only 9.5%, suggesting that of the various economic factors influencing alcohol consumption, the 2% duty escalator had the greatest effect (fig 5).

It may be surprising that changes in alcohol affordability could have a rapid effect on alcohol related deaths; it can take 10 years or more of very heavy drinking to develop liver cirrhosis. But this is exactly what would be predicted from experience in other countries. When the minimum price of alcohol increased by 10% in a Canadian province, a 32% decrease in directly attributable alcohol related mortality occurred within 12 months, and most deaths were from liver disease. Similarly, when Mikhail Gorbachev introduced alcohol reform in Russia in the 1980s, the maximum impact on mortality occurred within 18 months, including for liver disease. Alcohol related liver deaths occur from acute-on-chronic liver failure related to the severity of recent drinking. Directly attributable deaths are easily measured but comprise only around one third of total alcohol related mortality—the remaining partially attributable deaths occur as a result of hypertension, stroke, cancer, and other causes and cannot be directly tracked. So although directly attributable deaths decreased by around 600 each year, the fall in total alcohol related deaths may have been nearer 2400 each year. The proportion of this decrease that might be related to the 2% duty escalator compared with other factors is not known. Though the causative link between this changing trajectory of alcohol related deaths and economic factors remains unproved, the deaths are clearly alcohol related (fig 2), and occur in people drinking very large quantities of the cheapest alcohol available; the median alcohol consumption of patients with alcohol related cirrhosis is around 120 units/week, and in other dependent drinkers it is even higher.

There have been no important developments in treatment or disease coding over this period, and we are not aware of any clinical or environmental factor that could account for the change in 2008. In any natural experiment there are always potential confounders and unknown factors, but on balance, we believe that economic factors are the most likely cause of the change.

Testing the theory

Our hypothesis is testable because the economic factors no longer operate. Incomes are starting to rise, and following a fierce campaign of lobbying by the Wine and Spirits Trade Association (WSTA) the duty escalator was dropped in 2014. In the budget of March 2015 alcohol duty was cut by a further 2% for spirits and cheap cider. An influential Ernst and Young impact analysis commissioned by WSTA omitted to mention any of the economic costs of alcohol related harm outlined by the OECD but appeared to persuade the Treasury that the health of the drinks industry was more important than that of alcohol consumers. Support for the “drop the duty” campaign came from unlikely sources; Jane Ellison, undersecretary of state for public health, was featured on the front page of drinks industry website Harpers.co.uk stating that she had forwarded a “drop the duty” email in support of the duty reduction to the chancellor of the exchequer.

Threshold or minimum unit pricing is a fiscal policy that is exquisitely targeted at heavy problem drinkers who consume large quantities of the cheapest alcohol. Although the
legislation was passed by the Scottish government and the bill signed by the Queen, it was held up by a legal challenge from the drinks industry. A recent verdict from the European Court of Justice ruled in favour of minimum pricing provided that the Scottish government can show that it is more effective than fiscal alternatives.11 12 This could lead to an interesting and unusual situation whereby cheap alcohol is constrained by minimum pricing in Scotland, perhaps swiftly followed by the Ireland, Northern Ireland, and Wales, all of which have unveiled plans for minimum unit pricing legislation.13 14 15 16 But remains unrestrained in England, where incomes are likely to outstrip changes in alcohol taxation. If the population consumption theory holds we predict that alcohol related deaths will decrease in the devolved nations, but in England the relentless rise is likely to resume as incomes outstrip rises in taxation.

Contributors and sources: NS and IG are academic hepatologists who have studied and published extensively on public health aspects of alcohol related disease and liver rationale. The rationale for this article was to put the trends in alcohol related harm in the context of changes in the alcohol marketplace which in turn have been driven by changes in fiscal policy. All data sources are in the public domain. Competing interests: We have read and understood BMJ policy on declaration of interests and declare SH has received research grants from British Liver Trust, Alcohol Education Research Council, and various other funding bodies. He has undertaken paid consultancy work and received travelling expenses from pharmaceutical companies developing drugs for the treatment of inflammatory bowel disease, liver disease, and viral hepatitis and been paid for medicalcogework in the area of hepatitis C and alcohol related liver disease. He is a clinical adviser to Public Health England, a scientific adviser to European Public Health Alliance, and Royal College of Physicians representative on EU Alcohol Policies, EU Alcohol Forum, Alcohol Health Alliance UK, UK Department of Health, Home Office, Department of Transport, NICE, Southampton City Council, British Liver Trust, EASL, BASL, and BSG. IG is chair of the Alcohol Health Alliance UK.

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3 Academy of Medical Sciences. Calling time—The nation’s drinking as a major health issue. AMS, 2004.


12 Ernst and Young. The Wine and Spirit Trade Association economic impact assessment December 2013. Ernst and Young, 2015.

13 OECD. Tackling harmful alcohol use: economics and public health policy. 2015.


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Key messages

- Alcohol related deaths between 1980 and 2008 in England and Wales increased threefold, probably driven by the increased affordability and availability of strong alcohol.
- Harmful and hazardous drinkers consume around 70% of all alcohol sold.
- Alcohol related deaths peaked in 2008 and have declined slightly since.
- This change is likely to be due to economic factors affecting alcohol consumption of heavy drinkers— the recession and 2% duty escalator.
### Table 1 | Alcohol consumption recorded in 2011-13 Health Surveys for England37

<table>
<thead>
<tr>
<th>Alcohol risk grade (cut-off weekly units for women/men)</th>
<th>None</th>
<th>Low risk ≤14/21</th>
<th>Hazardous &gt;14/21</th>
<th>Harmful &gt;35/50</th>
<th>Extreme ≥75</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No (% of respondents)</td>
<td>4488 (18)</td>
<td>15 583 (62)</td>
<td>3899 (16)</td>
<td>787 (3.1)</td>
<td>317 (1.3)</td>
<td>25 074 (100)</td>
</tr>
<tr>
<td>Total (% weekly consumption (units))</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal cider/lager/beer</td>
<td>—</td>
<td>33 661 (33.1)</td>
<td>39 470 (38.8)</td>
<td>15 096 (14.8)</td>
<td>13 438 (13.2)</td>
<td>101 666</td>
</tr>
<tr>
<td>Strong cider/lager/beer</td>
<td>—</td>
<td>2 173 (18)</td>
<td>3 356 (27.8)</td>
<td>2 527 (20.9)</td>
<td>4 022 (33.3)</td>
<td>12 079</td>
</tr>
<tr>
<td>Spirits</td>
<td>—</td>
<td>12 773 (34.4)</td>
<td>14 173 (38.2)</td>
<td>5 255 (14.2)</td>
<td>4 894 (13.2)</td>
<td>37 096</td>
</tr>
<tr>
<td>Sherry</td>
<td>—</td>
<td>1 252 (57.6)</td>
<td>564 (25.9)</td>
<td>203 (9.4)</td>
<td>154 (7.1)</td>
<td>2 173</td>
</tr>
<tr>
<td>Wine</td>
<td>—</td>
<td>33004 (28.4)</td>
<td>46 937 (40.5)</td>
<td>19 000 (16.4)</td>
<td>17 079 (14.7)</td>
<td>116 021</td>
</tr>
<tr>
<td>Alcopops</td>
<td>—</td>
<td>1 481 (41.3)</td>
<td>1 134 (31.6)</td>
<td>546 (15.2)</td>
<td>422 (11.8)</td>
<td>3 584</td>
</tr>
<tr>
<td>All alcohol</td>
<td>—</td>
<td>84 345 (30.9)</td>
<td>10 5634 (38.7)</td>
<td>42 629 (15.6)</td>
<td>40 010 (14.7)</td>
<td>272 618</td>
</tr>
</tbody>
</table>
**Figures**

**Fig 1** Cumulative consumption of alcohol in England and Wales. Consumption of beer and lager is split between weak and strong beverages with a cut-off around 4.2.

**Fig 2** Cumulative alcohol related deaths for England and Wales.

**Fig 3** Mean weekly consumption of spirits and alcopops by children aged 10-15 (cumulative) and overall UK sales of spirits after introduction of alcopops in 1994.
Fig 4 Alcohol related deaths in England and Wales and consumption of specific types of alcohol (UK HMRC receipts) normalised to 100% in 1980. Consumption of beer and lager is split between weak and strong beverages with a cut-off around 4.2%. Consumption of wine, cider, strong beer/lager, and other spirits was independently associated with alcohol related mortality in a linear regression model ($R^2 = 0.99, P<0.001$). 

Fig 5 Alcohol related deaths in England and Wales, household income, and affordability of different alcohol types (income and affordability normalised to 100% in 1980), with two mortality extrapolations to 2030. 

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