DRUG & ALCOHOL FINDINGS *Hot topic*

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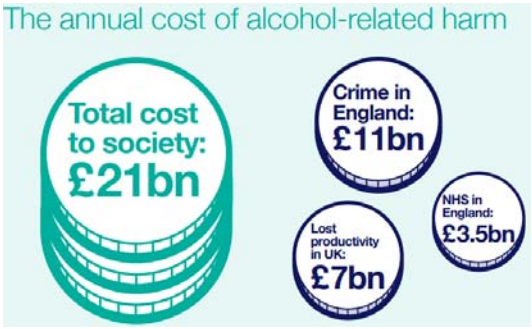
GO Measuring alcohol-related harm; politics and science

Putting a price on the harm of alcohol helps the government to demand action, authorities to generate a better response to harmful drinking, and campaigners to raise awareness of the harm caused by drinking. It is, in other words, a highly small-p politically salient figure – one which can be calculated in so many different ways and under differing assumptions, that it would be surprising if its malleability were not exploited to political ends.

National UK policy is based on the calculation that each year the adverse consequences of drinking cost society £21 billion. This figure given in the UK alcohol strategy was unpacked in the government's response to the consultation on the strategy: alcohol-related crime cost £11 billion in England and Wales at 2010/11 prices; at 2009/10 prices, across the United Kingdom lost productivity cost £7.3 billion; and the treatment of alcohol-related illness cost the National Health Service £3.5 billion – estimates repeated by the National Institute for Health and Care Excellence (NICE) in its quality standards on preventing harmful alcohol use ▸chart. The figures include some valuation of the emotional impact of alcohol-related crime (nearly £4.7 million) but not of the value to the drinkers of their diminished quality and lost years of life due to drinking or the emotional impacts on their family and other associates. They are an attempt to quantify the third-party and wider societal impacts of a drinker's drinking, on the assumption that the drinker themself is prepared to pay in money and some loss of life and quality of life for the pleasure they gain from drinking, and therefore suffers no net loss of value.



Government estimates of the annual cost of alcohol-related harm in the UK

The variety and history of such estimates has been handily compiled by the Institute of Alcohol Studies. They note that the £21 billion estimate has its roots in a report published in 2003 by the UK government's Cabinet Office, which estimated that in 2000/01, alcohol-related death, illness and crime cost England about £20 billion. An update of the costs to the NHS included in that estimate raised it to £2.7 billion at 2006/7 prices. In 2010 NICE limited its calculations to costs associated with healthcare, crime, antisocial behaviour and employee absenteeism, calculating an annual total for England of £12.6 billion. In that report inflation was estimated by 2008/09 have raised the costs to the NHS to £2.9 billion. At 2006/7 rates, alcohol was estimated to have cost Scotland £2.25 billion, of which the greatest part was due to lost and diminished productivity including unemployment and years of work lost due to premature death. For the UK as whole, in 2005/06 costs borne by the NHS were estimated at about £3 billion. The same study funded by the British Heart Foundation calculated alcohol-related deaths at 31,000 in 2005 and that in 2002, one in ten disability-adjusted life years had been lost to alcohol. Liver disease is a major component, in England and Wales predicted to lead to a cumulative total of 143,000 deaths over the 20 years from 2010, during which year the number was 6317.

Impacts on health and the costs of responding to those impacts are in some estimates overshadowed by the consequentially diminished size and productivity of the workforce. Across four high-income countries, these accounted for nearly three-quarters of the external costs (ie, not those affecting the drinker themself) imposed by drinking. Scotland was one of the four, where in 2001/02 productivity losses were calculated to have accounted for 58% of costs. In the UK as a whole, understanding of these impacts is limited by a lack of data about the effects of drinking on 'presenteeism' (reduced productivity at work), absenteeism, unemployment, and premature mortality among the workforce, as well as the impact on the people and families involved. The most recent and relevant UK government estimate (▸above) was £7.3 billion across the UK in 2009/10 out of an estimated "total cost to society" of £21 billion. The largest element in the £7.3 billion was lost output due to premature death; missing was the costs of reduced efficiency at work.

Depends where you look

Due to inequalities across different areas and social groups, the weight of the burden of alcohol-related harm depends to a large degree on where you look and who you look at. Alcohol-related death rates, for example, have consistently been higher in Scotland than in England, though the rate in Scotland has fallen sharply since the mid-2000s for both men and women, while the rate in England has been flat following a period of steady growth since the early 1990s.

In 2016, 7327 deaths were recorded in the UK as wholly attributable to and a direct consequence of drinking, an age-standardised rate of 11.7 deaths per 100,000 of the population. At 16.2 per 100,000, the death rate for men was more than double that for women, and at 40.3 reached its peak among 60–74-year-old men. Across both sexes, in 2016 the death rate peaked at 29.3 among 60–64-year-olds, a phenomenon seen only since 2015; in 2001 the peak age-band was 10 years younger. Among the countries of the UK Scotland remained the most affected, with death rates of about 30 and 12 per 100,000 among men and women respectively. At about 22 for men and 10 or 12 for women, England's North East region and Northern Ireland were not far behind, while at around 10–12 for men and 5 for women, rates in London and the South East and East of England were half those of the North East.

Regional disparities are tied up with and seem partly to parallel disparities in socioeconomic deprivation. In 2016, the rate of alcohol-specific deaths among males in the most deprived fifth of areas of England was about 30 per 100,000 and for women about 13, respectively 4.5 and 3.3 times higher than in the least deprived fifth of areas. Hospital admissions in which alcohol contributed to the primary reason for the admission follow a similar pattern to deaths, being most frequent among people living in the most deprived areas of England and progressively less frequent among those in better-off areas. In 2015/16 the disparity ranged from 790 admissions per 100,000 in the most deprived tenth of areas to 493 in the least deprived tenth.

Regional and socioeconomic disparities also partly parallel the prevalence of hazardous or harmful drinking, which according to household surveys conducted in England in 2014 and 2016 is most common in the North East and less common in the south of the country. In this study risk was defined in a way which conflated overall consumption and high-volume single-occasion drinking and their consequences. Part of the reason for greater levels of alcohol-related harm in northern regions may be that drinking there is more often single-occasion 'bingeing', while in the south near-daily drinking is more common. Strikingly, among adults who had drunk in the past week, health surveys in 2011–2013 found that the proportion of men who during that period had drunk twice or more of the recommended intake on a single occasion was at its height in the North East of England, while the same region had the lowest proportion of men who had drank on at least six of the seven days. The more deprived the area in which the respondent lived, the more likely they were to drink heavily at a sitting, while there was an opposing trend for near-daily drinking.

Disparities in the harmful consequences of drinking can be translated into monetary values and summed, offering a single total on which to compare regions and demographic groups. An example is a study which calculated the overall cost of alcohol-related ill-health and deaths in Scotland at £7457 million in 2009/10. Based on the components which could be broken-down by level of deprivation, the burden of alcohol-related harm was greatest among deprived groups, with 40% of the total cost coming from the 20% most deprived areas. In these areas the mid-point estimate of costs was £7240 million compared to £496 million in the least deprived fifth of areas. The largest share of costs (79%) derived from "intangible" components such as pain and suffering among the drinkers and those they affect, which do not have a market price, but do have a *value*, assessed by how much in a hypothetical situation people say they would be willing to pay to avoid them.

The 'alcohol harm paradox'

Greater alcohol-related harm associated with greater deprivation forms one arm of the so-called 'alcohol harm paradox'. The other arm is the association between deprivation and lower alcohol consumption. Together these form the 'paradox' – the observation that people of lower socioeconomic status drink less than their more favoured peers, yet experience greater alcohol-related problems. Its importance in the present context is that it demonstrates that harm from drinking cannot simply be assumed to correlate with the amount drunk, but must be directly assessed.

In England, proportionately fewer lower-status adults drink at all. Among those who do, lower status is associated with drinking less according to the AUDIT alcohol screening questionnaire's consumption measures, but also with greater harm and dependence as assessed by the same questionnaire – a disjunction mainly due to the concentration of harm among the most disadvantaged in society. In turn, this may partly be explained by the fact that while in England people of low socioeconomic status are less likely to exceed recommended safer drinking limits, they are more likely to drink at extreme levels. The differences are large; for example, adults living in the fifth most deprived neighbourhoods are over twice as likely as those in the top fifth to drink 680g of alcohol or more a week for women and

880g or more for men. Also, the more deprived the area in which someone lives and (for men) the lower their occupational status, the more likely they are to drink a large amount at a single sitting rather than drinking smaller amounts near-daily.

Also possibly accounting for the alcohol harm paradox is the clustering of other risk factors, aggravating the effects of drinking. In a phone survey of adults in England (which managed to interview only about a fifth of those phoned), the most deprived two-fifths of respondents were over ten times as likely as their better-off counterparts to combine drinking above recommended levels with smoking, excess weight, and either poor diet or lack of exercise. In contrast, among risky drinkers the better-off three-fifths were over twice as likely to be free of these other risk factors as the most deprived two-fifths. Concentration of harm among poorer risky drinkers is a key rationale for effectively pricing them out of excessive drinking by setting a high minimum price for a unit of alcohol, helping to redress the health inequality entailed in the alcohol harm paradox.

Comorbidity of drinking and other conditions is also an increasing feature of the caseload of problem drinkers in treatment in England – not only because the typical age of those in treatment has been rising, but because many older people will have been drinking at high-risk levels for some time and are likely to be experiencing illnesses such as liver disease and high blood pressure ▸ panel. Aging of the treatment caseload parallels that of the population drinking at harmful and dependent levels, shrinking as a proportion of the under 35s but increasing among those aged 45 and over.

What to count, what not to count

Among the shifting and uncertain sands of alcohol-cost calculations, some components such as alcohol-related liver-disease deaths seem relatively solid, but others are subject to assumptions and decisions about what to include and what to record which if varied would hugely change the estimates. The uncertainty is nowhere greater than when analysts attempt to attach £ signs to the impacts of drinking. In 2009 a review found 20 such studies which varied substantially in their methodologies and in their estimates, resulting for example in an implausibly large tenfold gap between estimates of the per capita costs imposed on the populations of Portugal and the USA.

Calculating costs alone is only part of the equation – drinking happens because the drinkers at least feel they get some benefits. When an attempt is made to calculate net costs (ie, benefits minus costs) what is missing from the calculations becomes even more critical than when costs alone are calculated. Notably, how much drinkers value the pleasure they get from drinking and its social roles are typically omitted.

AGEING CASELOAD RAISES PROFILE OF HEALTH PROBLEMS

To the challenges of treating dependence are increasingly being added the challenges of dealing with the aftermath of many years of substance use and the diseases of age.

The typical age of problem drinkers in treatment (including those also using other drugs) has been increasing. From 27% of the caseload in 2005/06 and 32% in 2009/10, by 2015/16 the over 44s constituted 42% of all drinkers in treatment, increasing in numbers from 46,996 in 2009/10 to 60,299 in 2015/16. In contrast, over the same period numbers aged below 35 fell from 52,706 to 39,625.

The caseload whose sole problem is drinking are older still. In 2014/15 and 2015/16 – the only years for which figures have been published – most were 45 or over, 52% and 53% respectively.

Public Health England has warned that many of these people will have been drinking at high-risk levels for some time and are likely to be experiencing illnesses such as liver disease and high blood pressure.

A prominent alcohol expert has argued that estimates of the net cost imposed on society by drinking have often been grossly inflated because (among other things) they assume that hazardous drinking must be irrational consumption, that crime benefits no one, that drinking has no social, psychological or indirect business benefits, and that productivity losses are not counter-balanced by benefits elsewhere and by other workers taking over the jobs of the alcohol-impaired, eventually balancing the original job loss with one more unemployed person gaining work. Critiques from some of the world's leading alcohol researchers broadly supported the thrust of the argument.

What counts in setting alcohol taxes?

Illustrative of the political salience of what we choose to count is the relatively high-profile spat between the free-market think-tank the Institute of Economic Affairs and the Institute of Alcohol Studies, whose focus is on promoting effective prevention of alcohol-related harm. In 2015 a report from the Institute of Economic Affairs had reconstructed the £21 billion cost

estimate for England originating from the Cabinet Office to include only direct costs to government and ultimately the taxpayer. Though some new costs were added (welfare payments), the figure amounted to just £3.9 billion in 2015 prices: £1954 million to treat alcohol-related injuries and ill health, £1626 million to tackle alcohol-related crime, and £289 million paid in benefits to those unable to work as a result of alcohol-related mental or physical health problems. It was an attempt to confine the debate on alcohol taxation to the balance between costs and revenue to the state, excluding costs borne by individuals or businesses. The result was an apparent net surplus for the Treasury of £6542 million, supporting the same author's call for UK alcohol duties to be halved "to make them less regressive and bring them closer in line with duties in other European countries".

The exercise has been portrayed as "an attempt to downplay the importance of alcohol's adverse societal consequences to reduce the possibility of a bold policy response and limit participation in the policy debate to a narrower range of stakeholders". Implicitly it rejected use of taxation as a public health measure to curb alcohol-related harm and resultant social costs, limiting it to its fiscal role of recouping direct costs to the state. For alcohol-health campaigners, the dramatic reduction in the cost of drink seemingly justified by the calculations would be a public health disaster, encouraging increased consumption and generating yet greater ill-effects.

> *Calculations seen as an attempt to downplay alcohol's adverse consequences and prevent a bold policy response*

The report drew a rejoinder from the Institute of Alcohol Studies, complaining that the Institute of Economic Affairs (IEA) had missed the policy point and even on its own terms, underestimated costs to the state. Especially by excluding the suffering caused by drinking, the IEA had, they said, bypassed the main concerns about drinking: "Most people who are concerned about the level of alcohol harm in the UK are not primarily motivated by a desire to balance the government's budget. Rather, they are concerned by the damage to public health, crime, social disorder and wider economic costs caused by excessive drinking."

As well as criticisms of costs being inflated, and calculations failing to take into account the benefits of drinking, many existing estimates have also reportedly either relied on out-of-date data or methodologies – some drawing on data between four and 12 years old, and others 'refreshing' figures with the latest available data, but failing to reconsider the procedures for arriving at them. A 2016 paper which examined recent debates about the cost of alcohol to England and Wales contended that "getting better numbers" is critical, but so too is "using numbers better" – in other words, reflecting on what these estimates represent and how we should use them is just as important as improving the data itself.

There is, for example, confusion about what the oft-cited UK Government £21 billion figure actually represents. Sometimes presented as (or presumed to be) the cost to the taxpayer, or the cost to the economy, the £21 billion in fact relates to the "external cost" to society – ie, the "costs not directly borne by the drinker". This is useful in that it provides a minimum baseline set of costs that almost everybody would agree (in principle) is relevant to public policy. More comprehensive estimates of the total social cost of alcohol, on the other hand, provide a better indication of the scale of the problem, but are unlikely to have clear policy implications, particularly given the difficulties of calculating the corresponding benefits to weigh them against. Among these is an estimate which along with other elements placed a financial value on lives lost or impaired due to health and crime related to drinking, resulting for England in 2006/07 in an estimated total impact on society valued at £52 billion.

In theory, calculations of the net (ie, after accounting for the benefits) costs to society of drinking and other health-impacting lifestyle behaviours would allow policymakers to understand the relative weights they should give to tackling them and the potential for different policy options to reduce these burdens. But in the experience of Colin Angus and colleagues from the University of Sheffield, "decision-makers and stakeholders are rarely interested in the net sum" of costs and benefits. Instead, they tend to be "asked for disaggregated outcomes which are relevant to the interests and remit of individuals or government departments" – the Department of Health primarily interested in costs to the National Health Service and improvements in health outcomes, and the Treasury interested in the impact on tax revenues.

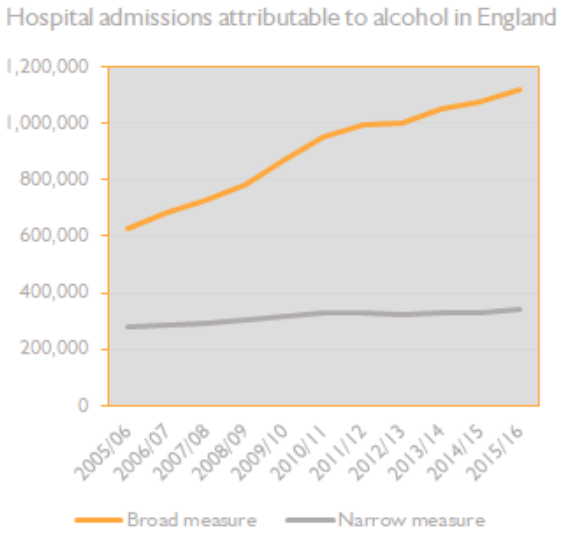
How cataract surgery could be counted as an alcohol admission

Calculations of the burden imposed on the NHS exemplify the shifting-sands nature of some estimates. The main indicator is alcohol-related hospital admissions, in England until 2014 understood to total the eye-catching figure of over a million a year and rising. This figure is not a number of admissions due to drinking, but the sum of the proportions of admissions for various illnesses which research suggests are on average attributable to drinking. For example, someone admitted with an illness on average 25% due to drinking plus someone else with another illness 75% due to drinking would count as one alcohol-related admission.

But the critical fact about this indicator is that an alcohol-related admission (or a fraction of one) can be counted *even if the primary reason why the patient came to hospital had nothing to do with drinking*. This is because in addition to primary conditions, clinicians can record up to another 19 secondary diagnoses. If any of these are on average alcohol-related, the admission is counted as alcohol-related. The example given by Public Health England is a patient admitted to have a cataract removed from their eye who is also recorded as suffering from alcoholic liver disease. That disease may have little to do with the eye complaint or why the patient was admitted to hospital, but still the admission would be counted as wholly attributable to alcohol.

Not only is this catch-all number far higher than admissions where the primary diagnosis was alcohol-related, it has also been rising much more steeply as hospitals record more and more secondary diagnoses. Inflation in secondary diagnoses is thought to have been at least partly motivated by the fact that it makes patients look more ill, which in turn makes hospitals' death rates look better. Whatever the motivation, the more secondary diagnoses are recorded, the greater the chance that some will be among those considered *on average* alcohol-related; there is no need for a clinician to judge whether in *this particular case* drinking was indeed a factor in the admission. The result can be more recorded 'alcohol-related admissions', even if alcohol-related illness rates have actually remained stable and alcohol's contribution to the hospital workload has remained unchanged.

The impacts of including or excluding secondary diagnoses are huge. Between 2002/03 and 2011/12, the broader indicator more than doubled, rising by nearly 140% from 510,700 to 1,220,300, justifying concerns over alcohol-related harm rapidly escalating to epidemic levels. Stripping out the secondary diagnoses – leaving only those in which drink was thought at least partially responsible for the *primary* reason for admission – reduced the increase to 41% from 142,000 to 200,900 – not good, but a rise less than a third as steep.



The way hospital admissions attributable to alcohol are counted *matters*. Choose the 'broad measure' and alcohol-related harm appears to be rapidly escalating to epidemic levels. Choose the 'narrow measure' and the long-term escalation in harm is decelerated.

In the end Public Health England decided to continue to publish the broader numbers including secondary diagnoses, but to introduce a narrower measure reliant mainly on primary diagnoses. Additionally the narrower measure includes some secondary diagnoses when rather than the illness itself, the *cause* of the illness is on average related to drinking, such as an assault causing a facial injury.

The revision made a huge difference to numbers, in 2015/16 resulting in a total of 339,280 alcohol-related admissions compared to 1,119,020 under the broader

classification, and reducing the increase since 2003/04 from 127% to 43%. It was this narrower measure which the Department of Health decided to use for the purposes of monitoring public health and assessing the success of health and alcohol policies, slashing the total to a third of the dramatic 'over a million' figure and decelerating the steep long-term escalation in admissions under the broader measure. The implication was that the alcohol-related harm these represented also rose far less steeply than was implied by the previous measuring system ▸ chart.

As rehearsed by Public Health England, there are good reasons for the new, more restricted indicator of admissions, but there are other benefits too for a government concerned to present its policies as working – particularly, according to an article published in one of Britain's leading medical journals, the voluntary 'responsibility deal' the Department of Health brokered with the alcohol industry in lieu of more intrusive intervention.

What is an alcohol-related death?

Since 2016 the tally of alcohol-related deaths in the UK has been refined down to just those recorded as wholly attributable to and a direct consequence of drinking. The new definition was adopted after consultation and results in a total about 19% lower for men and 25% lower for women because it now excludes deaths partially attributable to drinking. However, trends over time remain similar under both definitions.

What does change is the disparity between the countries of the UK, since the new definition makes least difference to Scotland and Northern Ireland and most to England, widening the gaps between these countries. For example, in 2016 under the old definition the rate in Scotland for men was was 69% greater than in England, but under the new, more restricted definition, 99% greater. Inevitably the new definition underestimates the total number of deaths which would not have happened (or happened so soon) if the deceased had not been drinking, because it excludes deaths partially attributable to alcohol, such as cancers of the mouth, oesophagus and liver, and particularly underestimates this number among those aged 65 and above.

Commenting on the decision to change the definition, *The Lancet* was most concerned with its potential impact on "efforts to reduce alcohol-related harms" in the UK. "[I]t is not difficult to imagine how it might mitigate urgency" was their main complaint, signifying that as with hospital admissions, how the deaths are counted has small-p political implications.

Reducing the burden

Revisions and critiques which slash (net) alcohol-related harm compared to other estimates are hardly splitting hairs, but despite the uncertainties about its magnitude, there is one certainty: social costs related to drinking are substantial. This burden both reflects and calls in to question the embeddedness of drinking in British society – an embeddedness which generates controversy over how to reduce the burden. In the mix are universal prevention programmes usually targeting all young people in a population or sub-population, price rises, use of licensing powers, widespread screening and brief advice in surgeries and hospitals, and treating the worst cases.

Policy discourse over a minimum unit price for alcohol illustrates how (given a favourable policy climate) understandings of the scale of the alcohol problem elevate the topic on the political agenda, prompting consideration of what previously was unthinkable. In Scotland, adoption of minimum-unit pricing as a key component of a comprehensive alcohol strategy was "partly enabled by a broad set of harms being linked to alcohol and the economic benefits of reducing these being costed". Estimates of the economic, health and other social costs associated with drinking helped to make these harms visible within policy discussions, and led to a broad range of stakeholders linked to each of these domains (including health professionals, police, the third sector and some industry actors) coming together to advocate for an effective public health policy (1 2) – a process described in another hot topic.

The apparent 'hardness' and magnitude of alcohol-related costs is seen as demanding correspondingly hard and extensive counter-measures. In a 2016 evidence review also published as a journal article, Public Health England observed that "stronger overall policy environments" were associated with lower levels of binge drinking and alcohol-related

> *The 'hardness' and magnitude of alcohol-related costs is seen as demanding hard and extensive counter-*

measures

cirrhosis mortality. One gauge of 'strength' was consistency of alcohol policies – for example, not undermining the use of warning labels highlighting the risks of alcohol consumption with a unit price that encourages heavy drinking. Overall though, it was relatively inescapable, blanket availability restrictions which found most favour, rather than information, education, exhortation or treatment which the individual is free to ignore or reject: "While these policies vary in their effectiveness and cost-effectiveness, evidence supports those that reduce the affordability of alcohol as the most effective and cost-effective approach to prevention and health improvement."

After surveying the field, experts convened by Britain's National Institute for Health and Clinical Excellence (NICE) also prioritised national policy initiatives to restrict alcohol availability by making it less affordable, available in fewer outlets for less time, and promoted less visibly. That uniquely among the nations of the UK, England has no plans to introduce an effectively health-promoting price-raising strategy places the government in that country directly at odds with its own public health advisers.

The studies thrown up by this search address one of the most pressing of Britain's social and public health issues, but one for which the UK has yet to implement an effective way of reconciling the need to reduce harm with the centrality of drinking in public and private life.

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