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# Doing it by numbers: A simple approach to reducing the harms of alcohol

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## Abstract

Alcohol use is one of the top five causes of disease and disability in almost all countries in Europe, and in the eastern part of Europe it is the number one cause. In the UK, alcohol is now the leading cause of death in men between the ages of 16–54 years, accounting for over 20% of the total. Europeans above 15 years of age in the EU on average consume alcohol at a level which is twice as high as the world average. Alcohol should therefore be a public health priority, but it is not. This paper puts forward a new approach to reduce alcohol use and harms that would have major public health and social impacts. Our approach comprises individual behaviour and policy elements. It is based on the assumption that heavy drinking is key. It is simple, so it would be easy to introduce, and because it lacks stigmatising issues such as the diagnosis of addiction and dependence, it should not be contentious.

## Keywords

Alcohol, harm reduction, evidence-based approach, numeric approach, public health

## Introduction

In almost all countries in Europe alcohol is one of the top five potentially modifiable risk factors causing disease and disability (<http://www.healthmetricsandevaluation.org/gbd/country-profiles>), and in the eastern part of Europe the number one risk factor (Lim et al., 2012). In the UK alcohol is now the leading cause of death in men between the ages of 16–54 years, accounting for over 20% of the total (<http://www.nwph.net/nwpho/publications/alcoholattributablefractions.pdf>). Europeans above 15 years of age in the EU on average drink 9800 g of pure alcohol per year – twice that of the rest of the world (Shield et al., 2012; for comparison see World Health Organization (WHO), 2011). Alcohol should therefore be a public health priority, but it is not (Anderson and Baumberg, 2006, [http://www.ec.europa.eu/health/ph\\_determinants/life\\_style/alcohol/documents/alcohol\\_europe.pdf](http://www.ec.europa.eu/health/ph_determinants/life_style/alcohol/documents/alcohol_europe.pdf)). This paper puts forward a new approach to reduce alcohol use and attributable harms with the potential to have major public health and social impacts. Our approach is simple, so it would be easy to introduce, and because it lacks stigmatising issues such as the diagnosis of addiction and dependence (Schomerus et al., 2011), it should be uncontentious.

## The scale of the problem

The health damage caused by alcohol in European regions is shown in Figure 1 – it is large and spread across many organs systems, in addition to societal impacts. The beneficial impacts of alcohol on ischaemic disease and diabetes are minimal compared to the burden (see Figure 1), but relatively most pronounced in Western Europe. Just to give some examples of specific health harms: more than three-quarters of liver cirrhosis deaths, 7% of cancer deaths and 25% of injury deaths in adults under 65 years of

age in Europe in 2004 were estimated to be due to alcohol (Rehm et al., 2012). In total, the annual social costs to EU countries of alcohol damage have been estimated at €125 billion in 2003, which corresponds to 1.3% of the gross domestic product of these countries (Anderson and Baumberg, 2006).

In most areas of harm, and certainly in terms of health, the negative impacts of alcohol increase in a non-linear way with intake (Rehm et al., 2010, 2011). As intake increases, there is an exponential increase in harms – see Figure 2(a) for the example of injuries (see Rehm et al., 2011, for a similar risk curve for chronic disease). This means that for intakes of more than 50 g pure alcohol per day (two-thirds of a bottle of wine or equivalent), any decrease in alcohol consumption gains proportionately more in terms of health gains. As shown in Figure 2(b) for injury fatalities, halving intake from 100 to 50 g per day gives an eight-fold benefit in terms of reducing health harms (see also Rehm and Roerecke, 2013, for examples of the effect of reducing drinking on all-cause mortality). Note that this example is specific for alcohol use, and only applies as the mortality risk curve for this substance and mortality outcomes are exponential. The risks of other substances on mortality may have different shapes.

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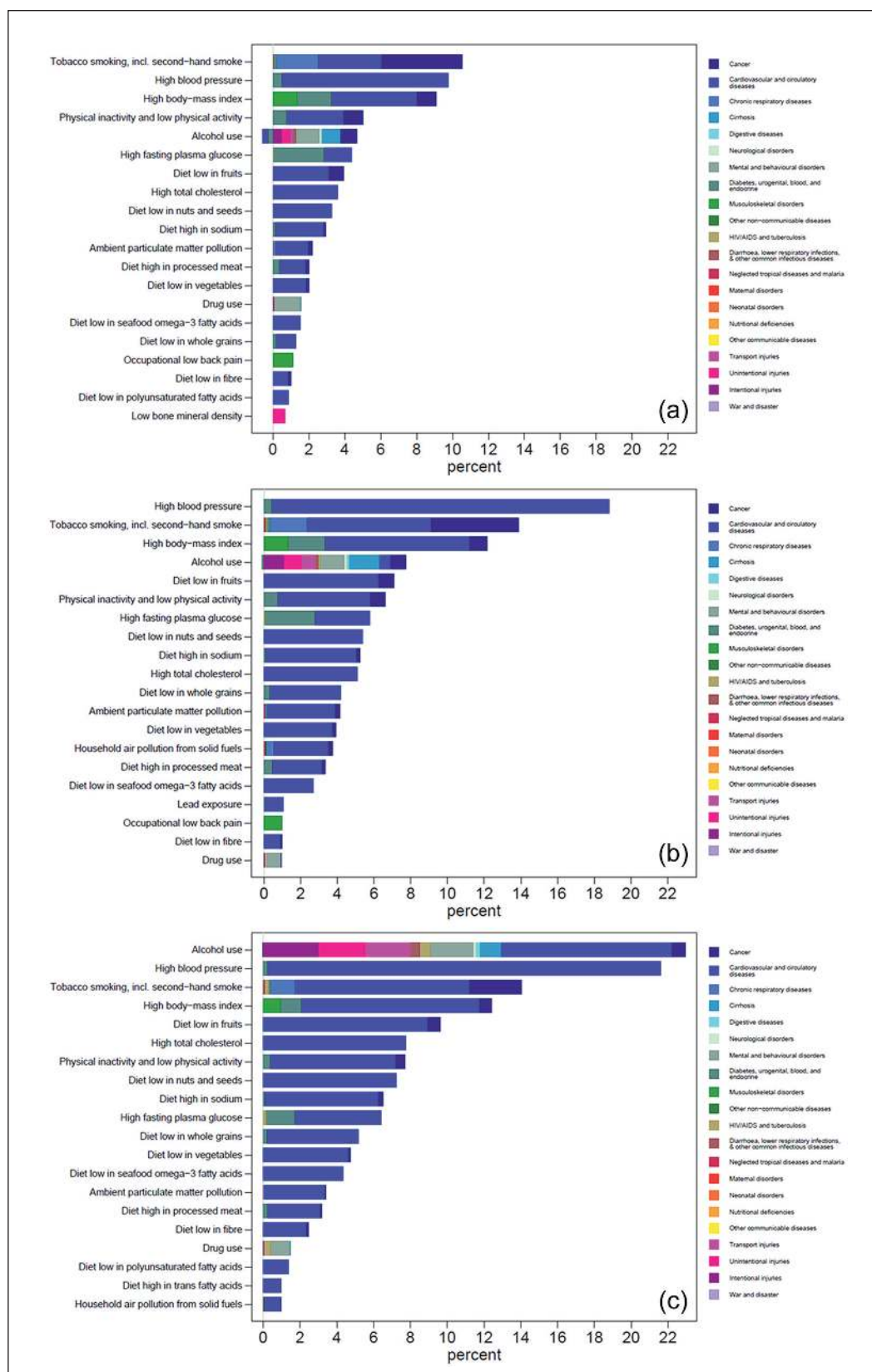
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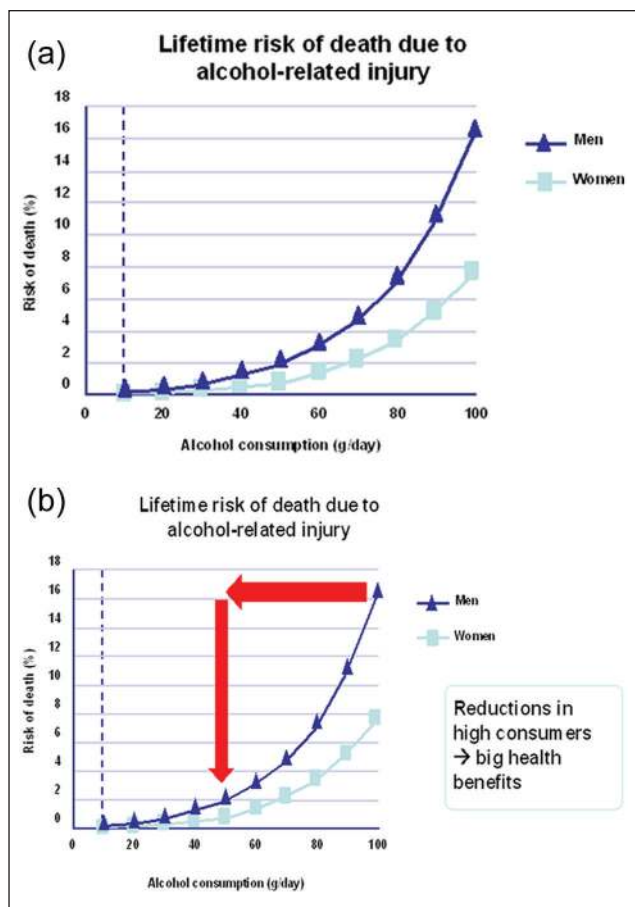
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**Figure 1.** Percentage of disability-adjusted life years (DALYs) due to risk factors in three different regions of Europe: (a) percentage of Western Europe DALYs, 2010; (b) percentage of Central Europe DALYs, 2010; (c) percentage of Eastern Europe DALYs, 2010. Source data obtained from Global Burden of Disease and Injury 2010 Study from Institute of Health Metrics and Evaluation, Seattle, Washington (<http://www.healthmetricsandevaluation.org/gbd/country-profiles>).



**Figure 2.** Lifetime risk of death due to alcohol-related injury, and the effect of reduction of consumption (adapted from Rehm J, Zatonski W, Taylor B, et al. (2011) *Epidemiology and alcohol policy in Europe*. *Addiction* 106: S11–S19 with permission from John Wiley & Sons, Inc). (a) shows the exponential rise in alcohol-related injury deaths with increase in intake; (b) shows how a 50% reduction in consumption from 100 g/day gives an eight-fold benefit in terms of harm. Note that these calculations are based on sustained changes.

It therefore follows that any interventions that reduce the amount of alcohol drunk will reduce harms so we should be developing policies that reduce alcohol intake. Less alcohol means better health in the same way that a lower blood pressure and lower cholesterol means less risk of heart attacks and stroke. Proven policies to reduce alcohol consumption exist (Anderson et al., 2009) and can readily be developed into both personal and public health agendas as discussed below.

## A ten point plan

### *The personal approach – four steps to better health*

1. Know your number.  
People need to know their alcohol intake in terms of grams per average day the way they (should) know their calorie intake, their cholesterol level and their blood

pressure. Gram measures are a global standard and so are to be preferred to units which vary from country to country.

2. Target your intake less than 20 g/day for men and 15 g/day for women.  
These levels of intake are not 'safe' but represent a threshold of harms that most authorities consider an acceptable level in relation to the pleasures of alcohol. Above these levels, the harms of alcohol begin to accelerate as intake increases.
3. Take pride in lowering your number.  
Just as a lower number for blood pressure and cholesterol give greater life expectancy, so lower alcohol intake leads to improved longevity and health. With all these major sources of ill health 'less is more'.
4. Take two drink-free days per week.

The past 50 years have seen a major change in the use of alcohol in the UK. Whereas in the 1950s alcohol was seen as a luxury it is now widely perceived as a dietary staple and many people drink with every evening meal. There is evidence that short periods of not drinking, even for a day, can help the liver recover from the effects of alcohol and so reduce the risk of liver complications such as fatty liver and cirrhosis (Marugame et al., 2007; <http://www.publications.parliament.uk/pa/cm201012/cmselect/cmstech/1536/153602.htm>).

## The policy approach - six points for governments

There are many proven interventions that will reduce alcohol consumption and thus harms. The top six interventions, in no particular order, are:

### *Instigate minimum pricing of alcohol at the level of 5 pence (0.06 Euro) per gram*

This would reduce the consumption of cheap alcohol without affecting that of quality products and has two main actions: it helps deter young people initiating drinking as these are the most cost-sensitive group; it also reduces consumption in very heavy drinkers (Purshouse et al., 2010) which, as can be seen from Figure 2, produces disproportionately major health gains. Overall, minimum pricing is a focused instrument within the general family of pricing policies which have shown to be very effective measures to reduce drinking and related harm (Wagenaar et al., 2009).

### *Require the labelling of grams per bottle of drink*

This would make it much easier for people know exactly how much they are consuming. This would be quite straightforward for the producer as the concentration of alcohol is currently displayed so the amount in grams is known. All that is required is changing the label.

### *Limit the places and times at which 'strong' alcohol can be bought*

This would apply to purchase outside of a licensed premise such as a supermarket. Sweden does this to good effect (for a

comparison of alcohol-attributable harm in Sweden to the rest of EU see Rehm et al., 2012; Shield et al., 2013). The Swedes have to plan their purchase of strong alcohol (defined as alcohol more than 35 g/L pure alcohol) between the hours of 0900–1700 on weekdays and 0900–1300 on weekends. This makes impulse buying, particularly when drunk, almost impossible. It makes people think about alcohol as a luxury and not a necessity, and makes it easier for people with drinking-control problems to avoid contact with alcohol in shops and supermarkets.

### *Encourage the use of proven treatments for alcohol dependence*

Several effective treatments exist, yet despite this fewer than one in 10 people with alcohol dependence in Europe are offered treatments (Alonso et al., 2004; Rehm et al., 2013a; Rehm et al., 2013c). Treatments include proven effective psychosocial treatments (Martin and Rehm, 2012) as well as pharmacological treatments: acamprosate, naltrexone and nalmefene, all of which have good evidence from modern trials of efficacy (Rösner et al., 2010a, 2010b). These can provide very significant health benefits to individuals and society and should be offered to all people with an alcohol dependence problem (see Rehm et al., 2013c, for potential public health gains; see Laramée et al. 2013, for potential economic savings). Other drug treatments with some evidence are sodium oxybate which has been licensed in Italy and Austria for many years, and baclofen (reviewed in Chick and Nutt, 2012). Disulfiram is an older treatment that works in some people but is underused and little researched (see guidelines of National Association for Health and Clinical Excellence (NICE), 2011). A better understanding of its mode of action might lead to improved versions and improved targeting of treatment. Anti-glutamate drugs such as topiramate also have shown efficacy (Johnson et al., 2007). The widening of treatments should be synchronised with acceptance of treatment goals other than abstinence, which may also help closing the treatment gap (Marlatt, 2001; Van Amsterdam and van den Brink, 2013).

### *Incentivise investment in research to help those with alcohol dependence*

The brain mechanisms of alcohol's actions and dependence are becoming better understood but there is still much to do. Despite promising targets for interventions such as the GABA<sub>B</sub> and dopamine receptors very little research is being done. In the UK, government sponsored research spend on addiction is tiny in comparison with the scale of the problem, even though addiction is a priority of the UK Medical Research Council.

Similar problems are seen in relation to the toxic effects of alcohol: although most of the patients in liver clinics have alcohol-related liver disease (Rehm et al., 2013b), less than 10% of the research carried out on liver disease is on alcohol-related harms. No drugs to treat alcohol-induced liver disease are available which in effect means that liver transplantation is the sole intervention for end-stage alcohol liver disease – a hugely expensive and limited option.

There is a pressing need to develop new approaches and use modern patient stratification techniques such as genetics and neuro-imaging measures to optimise current ones. Pharmaceutical investment in alcohol treatments is minimal and should be revitalised by government incentives.

### *Support the development of alcohol alternatives with safer profiles and antidotes*

The story of snus is the model here: snus, a buccally-active tobacco preparation, is much less harmful than smoked tobacco (Luo et al., 2007). Sweden has for many decades made this available in a specific and hugely successful attempt to reduce the proportion of Swedes smoking. It is responsible for them having one of the lowest rates of lung cancer in Western Europe (<http://globocan.iarc.fr/factsheets/cancers/lung.asp>). Modern science could make drugs that have similar beneficial properties to alcohol (relaxation, happiness, sociability) but without or with less of the unwanted effects (unsteadiness, anger, addiction, death in overdose) (Nutt, 2006). These drugs would also have the benefit of having antidotes that people could use to sober up and so, for example, drive themselves home after a party. If such drugs took over just part of the alcohol market they would pay for themselves many times over by reducing the vast costs of alcohol damage. The only reason that they are not yet currently marketed is that the producing companies do not have the assurance that governments would allow them to be sold. This needs to be made explicit so that research can go ahead with knowledge that success would be rewarded.

## **Conclusion**

We have presented a clear, simple and evidence-based approach to reducing the public and personal harms and costs of alcohol-attributable health damage that focuses on numbers not disease of diagnosis. It involves education and self-monitoring approaches that have already been established to work in relation to calories, cholesterol and blood pressure. Our approach is likely to be effective if properly rolled out and would have major beneficial effects on other effects of alcohol such as crime, road accidents and personal violence as well as public health.

One major advantage of the numeric approach is that it does not limit interventions by requiring medical professionals to make a diagnosis of an illness such as alcohol dependence and addiction in anyone. This is a major advance on what happens today as treatment is usually limited to those with a diagnosis. The focus on grams rather than illness would lead to considerable savings in medical time and would avoid diagnostic mistakes that could lead to a professional not recommending an intervention. It corresponds to the focus on blood pressure reading rather than on labelling associated disease processes (and the disease processes could, similarly to hypertension, be relabelled 'heavy drinking', so interventions would be covered – Rehm et al., 2013c). This focus thus avoids the stigma of labelling someone as alcohol-dependent or addicted. Major gains in health have come from treating and preventing tobacco use without the need to label smokers as being ill. We believe that alcohol interventions would be more widely effective if that same attitude was taken in relation to drinkers.

## **Conflict of interest**

DJN has acted as consultant to Lundbeck and D&A Pharma both of which have products for the treatment of alcohol dependence. He also acts as a research adviser to the Swedish Council for Working Life and Social Research.

JR is a consultant to Lundbeck.

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