European Review, Vol. 18, No. 1, 47–56 © 2010 Academia Europæa
doi:10.1017/S1062798709990123

Alcohol Misuse and its Consequences – An Overview and a European Perspective

IAN T. GILMORE

Link 5Z, Royal Liverpool University Hospital, Prescot Street, Liverpool L78XP, UK. E-mail: igilmore@liv.ac.uk

Alcohol is an important part of European culture and Europe currently has the world's heaviest alcohol consumption. There is some evidence for harmonisation of drinking habits across Europe, particularly in the total *per capita* consumption, types of beverage and frequency of teenage drunkenness. As part of this pattern, increasing consumption and deleterious health effects have been particularly noticeable in the United Kingdom and Ireland, and deaths from cirrhosis in these countries now exceed EU averages. This is a difficult area for Governments where the tension between regulation and personal choice is conspicuous and widely debated. In the UK, regulation has been weak but there are signs that the appetite for tackling the twin drivers of price and availability may be increasing.

Alcohol has been part of British and European culture for thousands of years, and for all but the last 50 of these the emphasis has been on the beneficial rather than harmful effects on health. In medieval times, beer was acknowledged to be a safer drink than water – the latter often of doubtful provenance – and the properties of wine were often associated with healing. Of course the potentially dangerous consequences of inebriation were apparent from earliest times. Alcohol production increased greatly around the industrial revolution, as did ways of preserving and transporting it, and these factors were associated with increased consumption and an obvious negative effect on work productivity and family life. Hence, in the late 18th and 19th centuries, temperance movements became more common, particularly in Northern European Protestant countries. In this period, it became apparent that some individuals could not forgo alcohol despite its ruinous effects and the concept of addiction to alcohol developed on both sides of the Atlantic.[1,2]

Consumption has always been strongly influenced by financial and social circumstances, and the two nadirs of consumption in the UK during the 20th century were during the First and Second World Wars. The first of these was associated with the introduction of UK licensing laws to restrict times of sales. This was not the first time that such attempts had been made[3] but they had been previously unsustainable and hence uniformly unsuccessful. During the First World War, Lord Kitchener observed that drink was a greater threat to the British than the German Army.

Per capita consumption in the UK has more than doubled since the Second World War and currently is variously estimated at 10–13 litres of pure alcohol per annum. Estimates of consumption are bedevilled by inaccurate recall of individuals in surveys, by legal or illegal imports and by licit or illicit home production. This increase has occurred in spite of a rising percentage of the population that do not drink at all (5% to 8.7% of men since 1980).[4] This rise in abstention in the UK is probably related to changes in ethnic minorities, and those European countries with the highest abstention rates (e.g. Turkey, Bulgaria) also have the highest Muslim populations.[5] Because of the factors listed above, worldwide figures of consumption are difficult to interpret, and some countries listed by the WHO as low-consumption ones, for example Sri Lanka, have huge problems in rural areas, from home and craft-manufactured spirits (ref WHO reports).[5] The highest consuming region in the world is Europe (over a quarter of the world's recorded alcohol production is within European Union countries) but within this region there are large variations in patterns and trends. Consumption is falling in France, Italy and Spain but rising in many 'emerging' Eastern European countries.[6]

There are striking differences in pattern, with southern European countries favouring drinking predominantly or exclusively with meals, and northern European ones drinking mainly without food.[7] There are also differences in the number of drinking occasions, with again a tendency for a south–north divide, with more frequent lighter drinking in Mediterranean countries and a less frequent but 'binge' pattern further north.[8]

Finally, gender, age and social class are important factors on consumption. Universally, women drink less than men and tend to drink less on each occasion,[9] and the percentage of abstainers is higher. However, there are interesting social changes taking place, and in the UK the biggest change in drinking habits is the increase in women, particularly young women, who have taken up drinking alcohol. This is mirrored by a fourfold increase in arrests of women for anti-social behaviour over the last decade. The reasons are complex but the convergence of male and female drinking habits probably relates at least in part to increasing emancipation of women and competition in the workplace. The drinking habits of adolescents have been the subject of particular scrutiny as awareness of the dangers of alcohol misuse has risen. Good data on trends in

young people have been collected through the European School Survey Project on Alcohol and Other Drugs (ESPAD) study, which has collected data every fourth year since 1995. It is difficult to generalise across countries, but the vast majority of children in all European countries have experimented with alcohol by the age of 15, with about three-quarters of children of this age, in central and Baltic countries, reporting having been drunk at least once, compared with half of 15 year olds in southern Europe. In the UK and Scandinavia more than 20% of 15 year-olds report binge-drinking (defined as five or more standard drinks in a session) three or more times in the previous month.[10] Although youngsters drink a wide variety of beverages, across the region beer and spirit consumption predominates. It is worthy of note that the strongest correlate of alcohol consumption in youngsters is smoking.[11] Influences of family, peers and socioeconomic status are more complex.

Turning to the health consequences of this consumption, Europe has the highest recorded burden of health harm in the world.[12] About 6% of all deaths and 10.7% of loss of disability-adjusted life years (DALYs) are attributed to drinking. One of the tragedies of alcohol-related health problems is that they peak in a relatively young and productive age-group (in distinction, for example to smoking). Alcohol consumption is related to greater mortality in young people than in any other age group, in Western European countries and most EU countries over 10% of female mortality and 25% of male mortality in those aged 15–29 years is alcohol-related. The social harm caused to young people from alcohol is more difficult to define and has not yet been documented.[12,13] It is likely, of course, that recording of bad health is better in developed countries, and there is much anecdotal evidence of widespread physical, mental and social harm in areas of the world such as India and Sri Lanka, and often in rural areas where spirits, licit and illicit, are distilled locally. Episodes of accidental contamination of supplies causing outbreaks of chemical poisoning are frequent in the third world, for example from pesticides. There are also examples of the deliberate use of methanol, polishes and disinfectants to manufacture fake spirits, as seen in Eastern Europe. The total economic burden of alcohol misuse has been recently calculated by Baumberg and Anderson.[14] The tangible costs of alcohol to Europe were estimated at €125 billion, with a range of €79–220 billion. Of these figures, about half were the direct costs of health, crime and so on, whereas half comprised the indirect costs of absenteeism, lost productivity and premature death. This has to be set against the income from taxation, usually about 1% of Government income, and the positive influences on the economy of producing (about $\frac{3}{4}$ million jobs), retailing and exporting alcohol products.

Harm can be divided into the problems of inebriation, addiction and organ toxicity. In Western Europe, the chronic sequelae of addiction and organ damage predominate but accidents and violence, which are more common in emerging eastern European countries, are also significant burdens, especially in younger

https://doi.org/10.1017/S1062798709990123 Published online by Cambridge University Press

adults. It has been striking in the UK and Ireland that the population is getting healthier, life expectancy is increasing, but statistics for alcohol-related deaths stand out as moving in the opposite direction. The second strategic report of the Irish Department of Health and Children in 2004 reported that the near 40% increase in alcohol consumption between 1992 and 2002 corresponded with an increase in alcohol-related deaths, especially the alcohol specific chronic (+61%) and acute conditions (+90%).[15] This contrasts sharply with a decrease in the overall number of deaths (−14% for all-cause mortality) and decreases in all cancer deaths and deaths from disease of the circulatory system, such as heart disease and stroke. The impact is often hidden, for example in 2002 the Irish Water Safety Commission reported that 37% of all deaths from drowning were alcohol-related.[15]

It was the Chief Medical Officer for England's Annual Report of 2001 that drew stark attention to the changing pattern of deaths from chronic liver disease over a 20 year period.[16] The EU average fell from 15 to 10 per 100,000, whereas the England frequency more than doubled to over 7 per 100,000 over the same period. Indeed the English figures have now overtaken the EU average – omitting the new accession countries not included in the original data. This change has been paralleled by rising and falling alcohol consumption in the UK and continental Europe respectively. While there are other causes of cirrhosis deaths, 70+% are the result of alcohol, and causes such as hepatitis B and C have not shown significant shifts in their prevalence over this period. Even more striking changes in the UK compared with Europe have been demonstrated more recently by Leon and McCambridge,[17] with Scotland standing out within the UK as showing the sharpest rise. The standardised mortality rates for liver disease have more than doubled in the last decade, particularly in the younger 15–44 year-old age group. The other chronic sequelae of alcohol misuse, such as pancreatitis, have almost certainly risen in a similar fashion.

The rise in UK deaths from cirrhosis is so striking that other contributory factors have been sought. The pattern of liver damage – in particular, the progression through fatty change, a steatohepatitis with progressive fibrosis and finally established cirrhosis – is indistinguishable from the changes seen in non-alcoholic fatty liver disease (NAFLD). This latter condition is particularly linked to diabetes and to obesity, both increasing in incidence, and it has been postulated that NAFLD and alcohol may produce a 'double-hit' on the liver.[18]

The pattern of drinking is likely to have an important bearing on the harm seen. For example, in a Scandinavian study, where groups were standardised for weekly alcohol consumption, those that drank in binges had a threefold increase all-cause mortality and a 6.5-fold increased mortality from acute myocardial infarction.[19] This is in sharp contrast to the probable beneficial effects of moderate consumption on ischemic heart disease.

An important observation in the UK has been the link between alcohol-related mortality and areas of social deprivation. Although self-reported average consumption differs little across socioeconomic groups in the General Household Survey, for men there are five times more age-standardised alcohol-related deaths in the most deprived as compared to the least deprived, using the Carstairs deprivation categories. The same trend applies to women.[20] The reason for this is not clear. Cirrhosis accounts for 85% of the deaths. Possibilities include a greater interaction in more deprived communities with NAFLD or a different distribution of consumption in these areas within the same mean. These figures have strong messages for studies on the social determinants of health.[21]

There is therefore a strong case in many countries in Europe for policies to reduce the burden of alcohol-related harm. On one level the consumption of alcohol is a matter of personal choice and libertarians will argue that there should not be state intervention when alcohol is a legal substance. This fails to take account of the fact that alcohol is 'no ordinary commodity', as highlighted in Babor's book of the same name.[22] Alcohol is a substance of addictive potential, and much of the pressure to consume, often to excess, is on young people below 18 years of age. There have been considerable differences across Europe in consumption trends in the last 20 years, with many of the high-consuming countries, such as France, Italy and Spain, experiencing quite dramatic falling consumption, whereas in the UK drinking levels have risen inexorably since the Second World War.[23] While reasons for this are complex, France has been quicker to legislate than the UK, with bans on broadcast advertising and sports sponsorship. In addition, the UK and Ireland stand out in Europe with blood alcohol drink-driving limits of 80 rather than 50 mg per dl. The National Alcohol Harm Reduction Strategy for England[24] (2004) relied heavily on voluntary partnerships with drinks producers and retailers and emphasised the importance of information and education for the public. Although an association between price, availability and consumption was acknowledged, it was deemed 'more complex', which appears to be the reason for not tackling these issues and, instead, the central thrust was summarised as: 'So we believe that a more effective strategy would be to provide the industry with further opportunities to work in partnership with the government to reduce alcohol-related harm'.[24]

Over successive years following the National Alcohol Harm Reduction Strategy for England, the health burden continued to increase, as shown for example by the rising numbers of hospital admissions each year.[25] Possible reasons include the fact that around the time of the National Strategy there were parallel changes in the licensing laws governing opening times and the granting of licences to premises. As Robin Room pointed out,[26] these changes of liberalising access to alcohol were paradoxical when simultaneously producing a strategy to reduce harm. The relaxation in access was seized upon more by the

off-licence trade – particularly supermarkets that were open 24 hours a day, seven days a week – than English pubs, and for the first time since the First World War alcohol could be purchased around the clock. Businesses offering 24-hour deliveries for telephone orders sprang up, and customers stopping at a petrol station at 3 am could also buy a bottle of spirits. This relaxation in the hours of sales was matched by serious changes in the law. Centrally, Government responsibility for licensing matters was moved from the Home Office (crime and disorder) to the Department of Culture, Media and Sport (tourism). Locally, responsibility was shifted from magistrates to local authorities. This latter move was not in itself a problem, but the regulations surrounding their authority were. For example, they were no longer required to take into account, or attach a condition relating to, public health when considering applications for a licence to sell alcohol. The reasons why these bizarre twin policies of the UK Government were implemented at a time when the rising tide of health damage from alcohol was first being brought to public attention[27] will be for historians to judge, but the health advocacy lobby was poorly organised at this time, in stark contrast to the drinks industry.

These events of 2004 (the licensing changes finally took effect in 2005) were in many ways a wake-up call for health professionals. There was increasing media interest in the societal effects of 'binge drinking', but the emphasis was on the anti-social behaviour that resulted in British cities, particularly on weekend evenings and nights. There has been a marked reluctance to engage with the fact that about a third of the population are drinking above recommended safe limits and that the biggest change in pattern has been towards home consumption. There can be little doubt that the changes in affordability seen over the last 20 years are relevant here. Since 1987, the affordability of beer and wine to take away has more than doubled (in real terms, then, it is less than half the price) whereas for those drinks bought to be consumed on the premises the increased affordability has been only in the region of 40%.[28] In 2006, more than 25 organisations with concerns over alcohol and health combined to form the Alcohol Health Alliance (UK) to make the case for action on health more consistently. Its initial priorities were the patchy and inadequate treatment services for patients with alcohol dependence, and the increasing affordability and availability, particularly the heavy discounting and purchase offers that encourage bulk-buying. Examples have been recently extensively quoted in British newspapers highlighting the sale of lager more cheaply than bottled water.

Health messages appear to be particularly difficult to get over to the general public in this area. The Department of Health in the UK produced guidance in 1996 on safe limits that roughly mirrored the guidance produced by Royal Colleges a decade earlier, but translated weekly recommended safe limits of 21 units (one unit is 10 ml or 8 g pure alcohol) for men and 14 for women into daily limits of 3–4 units for men and 2–3 units for women. This was widely interpreted as a relaxation of safe limits until it was added that two alcohol-free days each

week were advisable, which brought the two limits into line. Nonetheless, these safe limits have been widely criticised as having little evidence base to support them – a headline on the front page of *The Times* newspaper in 2006 called them 'plucked out of the air'. While there is an element of truth in that claim, it fails to recognise the huge inter-individual variation in susceptibility to alcohol-related harm that requires any guidance to veer on the side of safety. It remains clear, for example, that only 30% or so of heavy drinkers sustain serious liver damage, and the mechanisms are likely to be mainly genetic. For example, relevant polymorphisms have been found in genes coding for enzymes involved in the metabolism of ethanol and in the cytokine response to damage.[29] The susceptibilities are likely to vary between different forms of health damage, hence the need for conservative limits. Government are currently consulting on guidance to parents that alcohol should not be given to children under 15 years of age and that between 15 and 17 a maximum of 1–2 drinks should be taken once a week. This is guidance only, and the law prohibiting the administration of alcohol to children under the age of 5 years is unlikely to be changed.

In the UK, there is now a willingness for Governments to look at the influence of price and availability, where strong evidence for harm reduction exists.[30] In 2007, the Department of Health in England commissioned a study by the University of Sheffield to examine the evidence, and the findings were supportive of the link between both price availability and the health harm from alcohol.[28] In particular, the report highlighted that the influence of price was greatest on young people and heavy drinkers – providing, in effect, a targeted approach. The mechanism of tackling cheap alcohol is not straightforward. Increasing excise duty is the most obvious, but the bands of alcohol strength are fixed in European legislation such that it is not possible for the UK to tax a 14% wine more heavily than a 7% one. Voluntary codes within industry to fix a minimum price come up against anti-competitive laws. An attractive option is for Government to fix a minimum price per unit (8 g) of alcohol, as this approach targets heavy discounting and the products at the bottom of the market, but it could be argued that it selectively hits those least able to afford the products. In respect of availability, it is unlikely that the UK Government will reverse the hours at which alcohol can be sold, but it could introduce legislation that would require vendors to sell alcohol in shops and supermarkets in separate areas, as is the case already in many countries.

It is difficult to draw direct parallels between the UK and Ireland, where drinking has been rising inexorably in recent years, and continental Western Europe where the trend has been falling consumption and harm. However, there may be some convergence or harmonisation of drinking patterns within Europe, particularly with respect to recorded consumption, choice of beverage and youth drunkenness.[14] Parts of Eastern Europe stand out as showing particularly serious issues for health, with product substitution and extremes of violent deaths, factors that are not yet

converging with those of the rest of Europe. Alcohol has been with our society for millennia and will likely continue to be so, but there are real challenges being thrown up for Governments as to whether they should regulate more tightly how alcoholic beverages are used in their country or leave to the free market and personal choice as to how their citizens live with (or die from) their favourite drug.

Acknowledgement

This paper is based on a lecture given by Ian Gilmore at the 20th annual meeting of the Academia Europaea, held in Liverpool, UK, in September 2008.

References

1. V. Berridge (1989) History and addiction control: the case of alcohol. In: D. Robinson, A. Maynard and R. Chester (eds) *Controlling Legal Addictions* (Basingstoke: Macmillan), pp. 24–42.
2. B. Thom (2001) *A Social and Political History of Alcohol. International Handbook of Alcohol Dependence and Problems*. Edited by N. Heather, T. J. Peters and T. Stockwell (Chichester: Wiley).
3. J. Greenaway (2003) *Drink and British Politics Since 1830. A Study in Policy-making* (Palgrave Macmillan), pp. 19–86.
4. Office of National Statistics (2002) http://statistics.gov.uk/ssd/surveys/general_household_survey.asp
5. World Health Organisation (2004) *Global Status Report on Alcohol* (Geneva: Department of Mental Health and Substance Misuse, World Health Organisation).
6. M. McKee, J. Pomerlau, A. Robertson, I. Pudule, D. Grinberga, K. Kadziauskiene, A. Abaravicius and S. Vaask (2000) Alcohol consumption in the Baltic Republics. *Journal of Epidemiology and Community Health*, **54**(5), 361–366.
7. Eurobarometer (2003) Health, food and alcohol safety. Special Eurobarometer 186. http://ec.europa.eu/comm/public_opinion/index_en.htm
8. Ö. Hemström, H. Leifman and M. Ramstedt (2001) *The ECAS-Survey on Drinking Patterns and Alcohol-Related Problems. Alcohol in Postwar Europe: Consumption, Drinking Patterns, Consequences and Policy Responses in 15 European Countries*. Edited by T. Norström (Stockholm: National Institute of Public Health, European Commission).
9. R. W. Wilsnack, N. D. Vogeltanz and S. C. Wilsnack (2000) Gender differences in alcohol consumption and adverse drinking consequences: cross-cultural patterns. *Addiction*, **95**(2), 251–265.
10. B. Hibell, B. Andersson, T. Bjarnason, S. Ahlström, O. Balakireva, A. Kokkevi and M. Morgan (2004) *The ESPAD Report 2003: Alcohol and other Drug Use among Students in 35 European Countries* (Stockholm, Sweden: The Swedish Council for Information on Alcohol and Other Drugs (CAN) and The Pompidou Group at the Council of Europe). www.espad.org

11. C. Currie, C. Roberts, A. Morgan, R. Smith, W. Settertobulte, O. Samdal and V. B. Rasmussen (2004) *Health Behaviour in School-aged Children (HBSC) Study: International Report from the 2001/2002 Survey* (Copenhagen, Denmark: WHO).
12. J. Rehm, B. Taylor and J. Patra (2006) Volume of alcohol consumption, patterns of drinking and burden of disease in the European region 2002. *Addiction*, **101**, 1086–1095.
13. J. Rehm, N. Rehn, R. Room, M. Monteiro, G. Gmel, D. Jernigan and U. Frick (2003) Global distribution of average volume of alcohol consumption and patterns of drinking. *European Addiction Research*, **9**(4), 147–156.
14. P. Anderson and B. Baumberg (2006) *Alcohol in Europe* (London: Institute of Alcohol Studies).
15. Irish Department of Health and Children (2004) *Strategic Task Force on Alcohol Second Report* (Dublin: Irish Department of Health and Children).
16. Department of Health (2001) On the state of the public health. *The Annual Report of the Chief Medical Officer of the Department of Health* (London: Department of Health).
17. D. A. Leon and J. McCambridge (2006) Liver cirrhosis mortality rates in Britain from 1950 to 2002: an analysis of routine data. *Lancet*, **367**, 52–56.
18. C. P. Day and O. F. James (1998) Hepatic steatosis: innocent bystander or guilty party? *Hepatology*, **27**, 1463–1466.
19. J. Kauhanen, G. A. Kaplan, D. E. Goldberg and J. T. Salonen (1997) Beer binging and mortality: results from the Kuopio ischaemic heart disease risk factor study, a prospective population based study. *BMJ*, **315**, 846–851.
20. C. Breakwell, A. Baker and C. Griffiths (2007) Trends and geographical variations in alcohol-related deaths in the United Kingdom, 1991–2004. *Health Statistics Quarterly*, **33**, Office of National Statistics, London.
21. World Health Organisation (2008) *Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health* (Geneva: Commission on Social Determinants of Health, World Health Organisation).
22. T. F. Babor, R. Caetano, S. Casswell, G. Edwards, N. Giesbrecht, K. Graham, J. Grube, P. Gruenewald, L. Hill, H. Holder, R. Homel, E. Osterberg, J. Rehm, R. Room and I. Rossow (2003) *Alcohol: No Ordinary Commodity. Research and Public Policy* (Oxford University Press).
23. *Strategy Unit Alcohol Harm Reduction project Interim Analytical Report* (2003) http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/su%20interim_report2.pdf
24. Cabinet Office (2004) *Alcohol Harm Reduction Strategy for England* (London: Cabinet Office).
25. North West Public Health Observatory (2008) Alcohol-attributable fractions for England. Alcohol-attributable mortality and hospital admissions. http://www.nwph.net/nwpho/publications/forms/dispform.aspx?ID=86
26. R. Room (2004) Disabling the public interest: alcohol strategies and policies for England. *Addiction*, **99**, 1083–1089.
27. Royal College of Physicians (2001) *Alcohol: Can the NHS Afford It. Recommendations for a Coherent Alcohol Strategy for Hospitals* (London: Royal College of Physicians).

28. *Independent Review of the Effects of Alcohol Pricing and Promotions* (2008) University of Sheffield. http://www.dh.gov.uk/en/Publichealth/Healthimprovement/Alcoholmisuse/DH_4001740
29. M. Pirmohamed, N. R. Kitteringham, L. J. Quest, R. L. Allott, V. J. Green, I. T. Gilmore and B. K. Park (1995) Genetic polymorphism of cytochrome P4502E1 and risk of alcoholic liver disease in Caucasians. *Pharmacogenetics*, **5**, 351–357.
30. Academy of Medical Sciences (2004) *Calling Time: The Nation's Drinking as a Major Health Issue. A Report of an Academy Working Party* (London: Academy of Medical Sciences).

About the Author

Professor Ian Gilmore graduated from the University of Cambridge in 1971 and became a consultant physician with particular interest in gastroenterology in Liverpool in 1980. His clinical and research interests have been in the field of liver disease, and, in 1999, he was made an honorary Professor in the Department of Medicine in the University of Liverpool. Since 2006 he has been President of the Royal College of Physicians of London, but retains an interest in alcohol-related health problems. He currently chairs the Alcohol Health Alliance (UK) and is also chairman of the Science Group of the Alcohol and Health Forum at the European Commission.