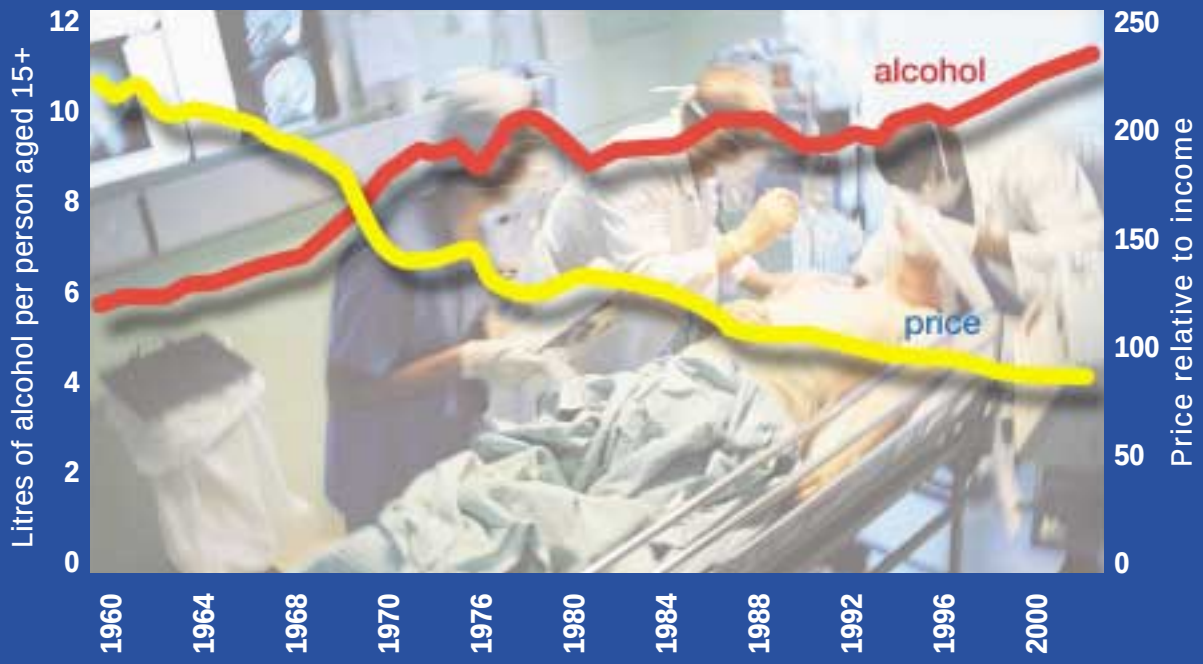
The Academy of Medical Sciences

Calling Time

The Nation's drinking as a major health issue



A report from the
Academy of Medical Sciences

With support from

March 2004

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The Nation's drinking as a major health issure

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Acknowledgements

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This Report is published by the Academy of Medical Sciences and has been endorsed by its Officers and Council. Contributions by the Working Group are made purely in an advisory capacity. The Review Group added a further 'peer-review' stage of quality control to the process of Report production.

The members of the Working Group and Review Group participated in this Report in an individual capacity and not as representatives of, or on behalf of, their individual affiliated hospitals, universities, organisations or associations (where indicated in the appendices). Their participation should not be taken as an endorsement by these bodies.

Cover image: *Consumption of alcohol in the UK (per person aged 15+) relative to its price 1960-2002 (Tighe, 2003)*

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Summary

Alcohol is an accepted part of our society, enjoyed by the majority of the UK adult population and has health benefits, particularly in the area of Coronary Heart Disease (CHD).

However, there is clear evidence of an increasing burden of harm from alcohol misuse: the Government has recognised this in asking the Prime Minister's Strategy Unit (PMSU) to develop a national alcohol harm reduction strategy, and the Academy of Medical Sciences welcomes this.

In their Interim Report, the PMSU estimated that alcohol consumption in the United Kingdom is responsible for a range of medical and social consequences:

- annual alcohol-related costs of crime and public disorder £7.3 billion, workplace costs £6.4 billion, and health costs £1.7 billion;
- 150,000 hospital admissions each year;
- up to one-third of all accident and emergency attendances;
- about 2.9 million, or 7%, of the adult population dependent on alcohol;
- seven out of ten respondents to a poll saw drinking in public places as a problem in their locality;
- 47% of victims of violence believed that their assailant was under the influence of alcohol;
- between 1993 and 2001 the total number of casualties from road accidents involving alcohol rose by one-fifth;
- between 30% and 60% of child protection cases involve alcohol. Up to 1.3 million children may be adversely affected by family drinking.

It is not the Academy's intention to duplicate this work and it expects the PMSU's strategy to provide an integrated and multifaceted approach. Specific high-risk groups, such as adolescent binge drinkers, and certain high-risk situations, such as drink-driving and drinking in public areas, are likely to be targeted.

The focus of this Report is the overall national consumption of alcohol, the evidence that this is a major determinant of harm and the opportunities for effective public health intervention that follow from this. It cannot be ignored that the *per capita* consumption of alcohol has risen by 50% in the UK since 1970, whereas in France and Italy it has more than halved.

The Academy has selected this focus in the knowledge that tackling general alcohol consumption is politically contentious and an area in which it is difficult for governments to intervene. But this is where there is evidence of opportunities to reduce harm, as part of a wider strategy.

Compelling recent evidence supports previous findings of a strong correlation between mean or median alcohol consumption and heavy or 'problem' drinking. These cross-sectional data are supported by time-series analyses that demonstrate changes in *per capita* consumption are directly reflected in changes in harm. For instance, in Canada a one litre *per annum* rise in mean alcohol consumption was associated with a 30% increase in alcoholic cirrhosis of the liver.

Any benefit of a reduced population consumption of alcohol on deaths from cirrhosis or other alcohol-related diseases has to be offset against the potential loss of beneficial effects of alcohol on CHD. While there may be beneficial effects of moderate drinking in the individual, this may outweigh health risks only in older people. At a population level, and at the *per capita* consumption found in the UK, it is unlikely that overall reductions in consumption would have an adverse effect on deaths or morbidity from CHD.

Strategies to reduce alcohol consumption may be general or targeted in their approach, but both tend to have more impact on heavier, at-risk drinkers. Educational approaches have been disappointing, but this may have been swamped by contrary advertising. Price modulation, usually through tax increases, is highly effective, particularly in under-age drinkers; a 10% rise in price of all alcoholic beverages has been estimated to reduce mortality from alcohol-related conditions by between 7 and 37%.

The large 'personal' allowances for alcohol imported from the European Union are disproportionately generous compared to cigarettes and would act against any benefits from price rises. The 'personal' allowance equates to a two year supply for a male drinking at

the maximum 'sensible' level, compared to a 40 day supply for a 20-cigarette-per-day habit.

Other crucial areas where alcohol consumption might be influenced include: the number and types of retail outlets for alcohol, the hours they are open, random breath testing and the control of the drinking environment, particularly at night in Britain's inner cities.

Therefore, the Academy concludes that there is much evidence to link *per capita* alcohol consumption with the burden of alcohol-related harm in the population. Policy measures to address this harm are likely to cut across government departments. It also takes us outside the normal range of concern of a body such as the Academy of Medical Sciences, but a broad reach is necessary to build an effective strategy to reduce alcohol related problems. **The scientific evidence indicates that, for the health of the public, action is required to reduce the consumption of alcohol at a population level.**

Recommendations

Recommendation one:

The balance of harm and benefit to society is influenced by the total amount of alcohol consumed. *Per capita* alcohol consumption should be a pillar of any comprehensive strategy that addresses alcohol-related harm. The Government should take the lead in identifying targets and monitoring progress towards them. As an immediate measure, the aim should be to prevent any further rise in alcohol consumption and strategies should then aim to bring consumption back to the 1970 level. Based on evidence of effectiveness, policy options include:

- increasing taxes on alcoholic beverages to restore the affordability levels of 1970, when they were more expensive relative to disposable income;
- reducing travellers' allowances in the EU from current maximum levels which give a heavy drinker a 272 day supply of wines and spirits, to a level which gives a 40 day supply (which is comparable to the smoker's allowance);
- a review of the advertising and promotion of alcoholic beverages, particularly to young people;
- better education and further medical research on the damaging effects of excessive alcohol consumption.

Recommendation two:

There must be an extensive debate, involving all sectors of the population, about alcohol-related harm and the policies that might reduce it. In order to achieve this goal the public must be properly informed through widespread education. Public engagement and discussion of the need to improve the Nation's health through curbing consumption can proceed only when they are in possession of the current evidence.

Recommendation three:

The statutory blood alcohol concentration level for drivers should be lowered from 80mg to 50mg%. Furthermore, there should be a zero statutory blood alcohol level as the limit for young drivers up to the age of 21.

Recommendation four:

An interdepartmental alcohol policy research programme should be funded to contribute to the evidence-base and further develop British alcohol policy.

Chapter one - *Introduction*

1.1 Alcohol gives pleasure to many people. Most of them will sustain no harm from its consumption, and in middle age and beyond they may derive health benefits from its use. The reason for this Report is that along with those benefits can go harm. That harm is currently at such a high and rising level as to constitute a threat to Britain's public health.

1.2 This Report seeks to make an evidence-based contribution to proposals on how this country can ameliorate the damage done by alcohol. There are many types of harm that can result from excessive drinking, and for that reason a comprehensive national policy aimed at harm minimisation will need to be similarly multi-faceted. It will include at least the following types of strategy:

- strategies targeted at particular sub-groups of the drinking population (e.g. homeless people, young drinkers, dependent drinkers);
- measures targeted at specific drinking situations (e.g. drink-driving, drinking at work, drinking that takes place in public spaces);
- policy responses may need to be targeted at the prevalence of particularly risky patterns of drinking (e.g. binge drinking);
- those relating to the overall level of national drinking (*per capita* consumption).

1.3 Implemented alone, neither the targeted nor the overall approach can constitute an entire policy response. What is needed is an integrated national alcohol policy with its constituent elements operating in a mutually supportive fashion, and with the policy sum greater than its parts.

1.4 The Academy is aware that the Government will shortly be publishing an integrated national plan intended to minimise the harm done by alcohol, and the Academy welcomes that initiative. This Report will make substantial use of data contained in the Interim Analytical Report of the PMSU (PMSU, 2003).

1.5 It is not the Academy's intention here to duplicate the likely totality of the Government's forthcoming alcohol policy choices. **The focus of this Report is the overall national consumption of alcohol, the evidence that this is a major determinant of harm and the opportunities for effective public health intervention that follow from this.** The Academy would like to emphasise however, that in its view, supply-side policies can only ever constitute one part of the total requisite policy response to alcohol problems, while at the same time believing that there are sufficiently important issues to merit focused attention. If the background significance of the Nation's drinking is not given sufficient attention within the total plan, a truly integrated and comprehensive policy will not be achieved.

1.6 The suggestion that dealing with alcohol consumption *per se* must be part of a national alcohol policy might seem no more than self-evident; who seriously could envisage a comprehensive alcohol policy that was blind to how much alcohol is being consumed? The truth of the matter is, however, that dealing with the drink itself is politically contentious and may be edged off the policy agenda. Governments can be averse to any reduction in their tax revenue, while powerful vested interests can be expected to resist any reduction in their profits.

1.7 This Report should not be misinterpreted as anti-drink. Its aim is to demonstrate that in the interests of the Nation's health, an overall reduction in consumption is likely to constitute a part of the requisite policy response to the current threat. Controls on drink are within this perspective, not the primary aim, but desirable only in so far as they can be shown to be capable of delivering significant public health benefits not easily achievable by other means. The Academy is not advocating control for control's sake.

Timeliness

1.8 The timeliness of a report focusing on the health

implications of the Nation's level and pattern of drinking derives partly from the imminence of the forthcoming Government report on alcohol policy. The Academy believes that the Government's document will stir public debate to which the Academy wants to contribute. But the timeliness of the Academy's focused consideration stems also from the fact that British alcohol consumption has over recent years increased without the public health implications being adequately confronted. Over those years access to alcohol has increased and that constitutes a second important background factor. Finally, a number of pointers suggest that there is escalation in the rate of problems caused by drinking. In the paragraphs that follow the Report will outline, in turn, some main facts relating to each of those background features.

Key trends

1.9 *Trends in national consumption of alcohol*
Among the pleasures of life brought about by the sustained rise in personal income that has been seen in Britain over the last century has been the increased affordability of all manner of consumer goods. Changes in retailing practice have at the same time given consumers increased choice and greater access to many products. Caught up in that general tide has been the increased affordability of beverage alcohol and enhanced access to it through proliferation of sales outlets and relaxation of licensing controls. Unsurprisingly, the result has been a rise in the *per capita* consumption of alcohol.

1.10 Figure 1 (PMSU, 2003) shows the changes that have occurred in British *per capita* consumption of alcohol over the course of the 20th century, with intake converted to litres of 100% alcohol. A number of phases in the story can be discerned.

- At the beginning of the 20th century national *per capita* consumption was higher than at any subsequent point in the ensuing 100 years. In the period preceding the outbreak of the First World War, there was, however, some decline in consumption.

- The war years of 1914-1918 saw a sharp but short-lived decline in consumption and there was later another dip during the inter-war years of economic depression. After the Second World War consumption for a time steadied at about four litres per head.

- From the late 1950s onwards, there has been something over a 100% escalation in *per capita* consumption from about four litres to over eight litres per head. Wine, beer and spirits have all contributed to that trend, but the increase in wine drinking has been particularly strong. These increases are an underestimate, as it takes no account of the increasing amounts of alcohol purchased abroad, particularly from France and Belgium, and imported by the individual. Based on a survey of UK adults in 2000, it was calculated that, on average, individuals are bringing back 1.1 litres of pure alcohol per adult (Leifman, 2001). Nor does it take account of any increase in smuggled alcohol, which nowadays frequently makes its way into wholesale and retail channels (HM Customs and Excise, 2002). Leifman's estimate of the total unrecorded consumption in the UK in 2000, including cross-border imports, smuggling, and home production, is two litres of pure alcohol per adult. This would add about 20% to the officially reported consumption in the UK.

1.11 The relevance of these background trends to concern about public health are discussed below.

1.12 *Trends in alcohol-related harm*
Cirrhosis of the liver has other causes besides alcohol. However, alcohol is responsible for over 70% of cirrhosis deaths and thus cirrhosis rates are a useful indicator of the intensity of the chronic health problems being experienced by a society as a result of excessive drinking. It is likely that over recent years medical treatment will have resulted in people with cirrhosis living longer than was previously the case, while at the same time virus-induced hepatitis has become a more important cause of cirrhosis. Evidence shows that infection with hepatitis C is more likely to cause cirrhosis in the presence of heavy drinking. With those provisos in mind Figure 2, from a recent Report of the Chief Medical Officer (CMO) for the Department of Health (CMO, 2001), will be considered. This figure shows an increase in deaths from chronic liver disease

among both men and women, and for older and younger age groups. Table 1, also from the CMO's report, shows where the increase in mortality has been greatest. In summary, from these data, the following changes can be identified as having occurred over the 30 years from 1970 to 2000. Deaths from chronic liver disease:

- increased among men in the age group 25-44 from 49 per annum to 470 (959%);
- increased among women aged 25-44 from 29 to 268 (924%);
- increased among men aged 45-64 from 339 to 1526 (450%);
- increased among women aged 45 to 64 from 240 to 769 (320%).

1.13 Across both sexes, and all age groups between 25 and 64, the annual mortality from this cause increased over this 30 year period from 659 to 3073, or 466%. This is at a time when deaths from chronic liver disease in Europe are falling, see Figure 3 (CMO, 2001).

1.14 Thus, although in absolute numbers the bigger increases in these deaths have been among the older segment of the population, it is the younger segment that has borne the larger percentage increase. The estimates should be discounted by 20-25% to allow for the increase in the base population. Furthermore, as is mentioned above, they need to be reduced a little more to allow for the cases due to infection with hepatitis C virus (alcohol intake at any level is likely to potentiate the progression of liver pathology caused by hepatitis C (Poynard *et al.*, 1997)). But we are left with the fact that over 30 years a prime indicator of chronic alcohol-related health harm has escalated over 450% across the population. That is an intensely worrying conclusion. Figure 4 from the PMSU review of evidence shows that in the last decade not only is the death rate rising but also it is peaking at a younger age.

1.15 To supplement the trend indicator given by the liver disease mortality data, a cross-sectional view on current costs and harms attributable to alcohol can be constructed by putting end to end some other data given by the PMSU (2003):

- *Costs.* Annual alcohol-related costs of crime and public disorder were put at £7.3 billion, work place costs at £6.4 billion, and health costs at £1.7 billion. Social security costs and costs of family impacts were not estimated.
- *Hospital admissions.* It was estimated that up to 150,000 hospital admissions occurred each year as a result of acute or chronic alcohol use.
- *Accident and Emergency (A&E) attendance.* One-third of all accident and emergency attendances may have alcohol causally implicated.
- *Alcohol dependence.* About 2.9 million, or 7%, of the adult population are reckoned to be dependent on alcohol.
- *Public disorder.* According to a MORI poll (2001), seven out of ten respondents saw drinking in public places as a problem in their locality.
- *Drinking and violence.* The British Crime Survey shows that 47% of victims of violence believed that their assailant was under the influence of alcohol.
- *Road accidents.* Fatal road accidents due to alcohol are still declining, and in 2001 were at an all-time low of 480. However, between 1993 and 2001 the total number of casualties from road accidents involving alcohol rose by one-fifth.
- *Impact on children.* Between 30% and 60% of child protection cases involve alcohol. Up to 1.3 million children may be adversely affected by family drinking.

1.16 From those facts and figures that portray Britain's present cross-sectional encounter with alcohol, one may conclude that the cost of alcohol misuse is enormous, with the adverse consequences of misuse very broadly experienced across multiple dimensions.

1.17 *Trends in the national access to drink*

'Access' is a concept which, for our purposes, can be seen as having three major elements - economic access as determined by the real price of the commodity, ease of access as determined by physical availability, and social access as determined by the cultural acceptability of drinking.

1.18 As regards trends in economic access, although the sales price of all types of beverage alcohol has

increased over the last 50 years, increase in price has not kept up with the rise in disposable income. The result of this disjunction has been a substantial increase in its affordability. Figure 5 shows for the years 1960-2002 the annual trend in *per capita* alcohol consumption for the 15+ age group. On the other vertical axis a composite annual index for price relative to income is given. This index is weighted for quantity of different beverages consumed and their prices, and takes 1995 as 100. The price of alcohol is divided by gross household income after tax. The data on alcohol consumption derive from Tighe (2003). Over the period of observation a cheapening in the real price of alcohol was matched by an increase in consumption. Price is only one of the factors influencing levels of consumption. But a considerable research literature (Österberg, 1995) confirms that it plays a role.

1.19 Regarding physical access to alcohol, the number of on-licensed premises, excluding clubs, was at a little under 61,000 in 1953 (Williams and Brake, 1980). According to the PMSU report that figure now stands at 78,500. A steeper climb occurred in the number of off-licenses: there were approximately 24,000 off-licenses in 1953 (Williams and Brake, 1980), with the PMSU giving 'more than 40,000' as the recent estimate. Besides the increase in the actual numbers of these outlets, there has been the broadening of the types of premises involved. For instance, the Licensing Act of 1961 made alcohol available in supermarkets.

1.20 Physical access to alcohol is influenced not only by the total count of on and off-licenses, but also by their hours of opening. The move in the UK over recent decades has been away from a strict regulation on hours and days of sale toward a situation where in most cities it is possible to purchase alcohol every day of the week and at any hour of the day (Raistrick *et al.*, 1999).

1.21 The expansion of drinking venues has been part and parcel of a new kind of city centre nightlife and the commercially driven entertainment scene that targets the demands particularly of young drinkers (Chatterton and Hollands, 2003; Hobbs *et al.*, 2003). Carried with those developments is an increased social access. Those lifestyle changes have probably helped increase the acceptability of drink and of heavier drinking, enhanced by advertising and branding campaigns. The impact of advertising on the population's consumption of alcohol is a difficult topic to research. Concerning the effect on children, a recent World Health Organisation (WHO) review (Babor *et al.*, 2003) remarked that 'The promotion of alcohol is an enormously well-funded, ingenious and pervasive aspect of modern life ... Exposure to repeated high-level alcohol promotion initiates pro-drinking attitudes and increases the likelihood of heavier drinking.' This Report expressed particular concern about the impact of advertising on young and under-age drinkers. Within that context the Academy notes that UK expenditure on alcohol advertising rose from £150 million to £250 million annually between 1989 and 2000, see Figure 6, and over that period the correlation between advertising expenditure and mean weekly alcohol consumption by children aged 11-15 years was very high (R=0.995) (WARC, 2002; Jernigan, 2001; Cooke *et al.*, forthcoming).

1.22 Therefore, as far as access is concerned, the background trend is: toward alcohol becoming, in real terms, progressively cheaper; toward easier physical access to the commodity and probably towards it becoming more appropriate to drink more heavily in various situations, with the pervasive advertising shaping awareness. Everything has thus come together to increase access to alcohol and increase consumption. We have here, in sum, a powerful and probably interactive set of reasons for the escalation in alcohol consumption seen in Figure 1.

Health benefits from drinking

1.23 As has been discussed, alcohol can confer health benefits as well as causing harm, and the Academy believes that an awareness of its benefits is important when framing policy. In men over 40 and post-menopausal women, the moderate consumption of alcohol leads to a decreased risk of myocardial infarction and ischaemic stroke. These benefits are discussed further in Chapter 2. However, from the perspective of policy, the important consideration is the net effect on the population in terms of the

balance of health benefits against harm. For health overall, alcohol is responsible for many more years of life lost than gained.

1.24 Even in the limited, but important, area of CHD, the findings from studies of what happens as consumption in a population goes up and down, in countries drinking in the general range of levels of Britain and Western Europe, there is generally no significant effect on CHD mortality.

1.25 As Skog (1996) suggested, it appears that the optimum level of drinking in a population from the point of view of general mortality is well below that of Britain.

The structure of this Report

1.26 Chapter 2 reviews the recent scientific evidence on the relationships between level and patterns of population drinking on the one hand, and degree of population level harm on the other. Chapter 3 looks at the research evidence on the effectiveness of different policy options that target access to drink, and Chapter 4 gives the Academy's conclusions and recommendations. The emphasis throughout is on the identification of the evidential basis for policy formulation in this arena.

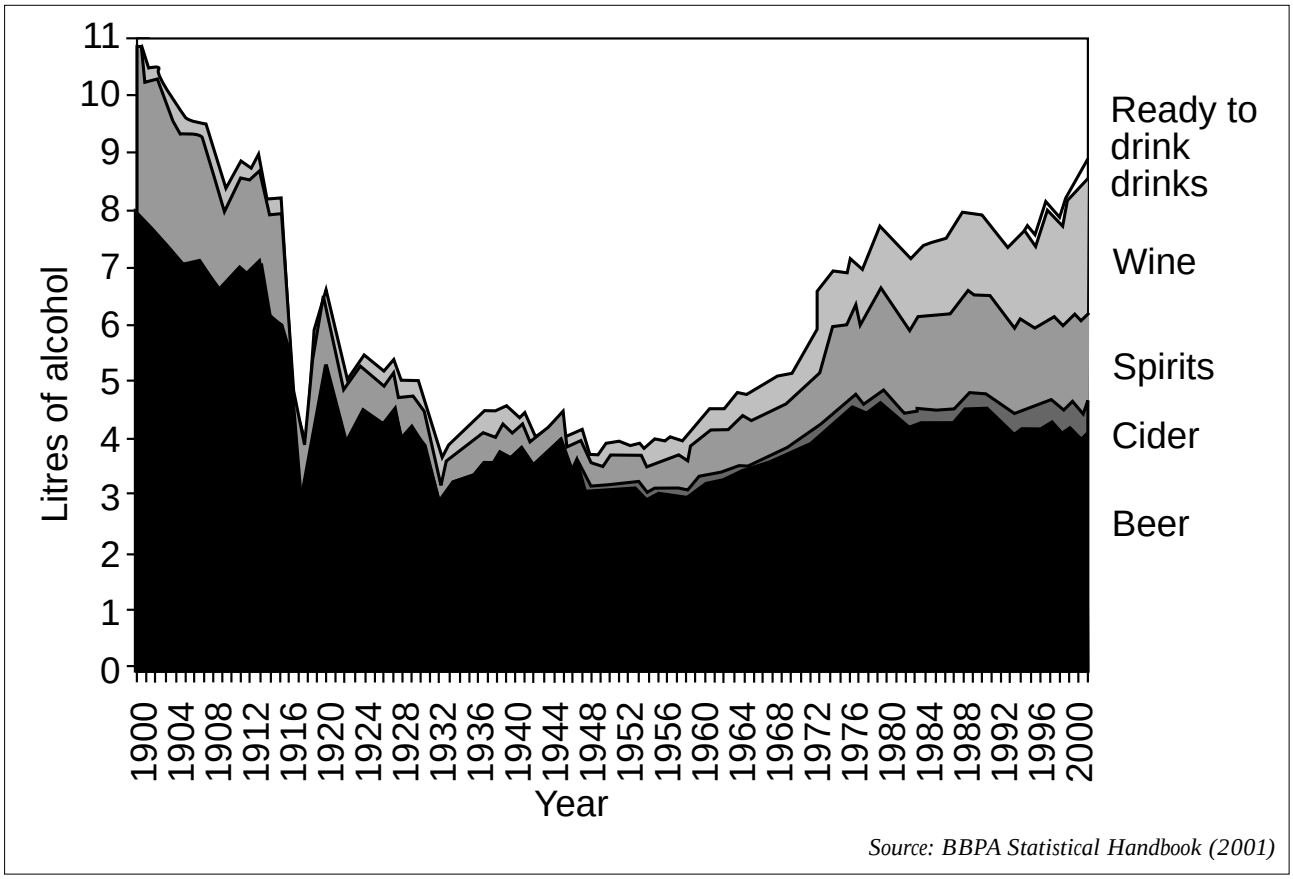
Table 1 - *Number of deaths from chronic liver disease, England*

Year	Men (age in years)				Women (age in years)			
	25-34	35-44	45-54	55-64	25-34	35-44	45-54	55-64
1970	16	33	124	215	7	22	86	154
1985	20	99	233	373	24	72	142	308
2000	68	402	805	721	60	228	405	364

Chronic liver disease (ICD-9 571), England
(there were changes in coding rules for causes of death in 1984 and 1993).

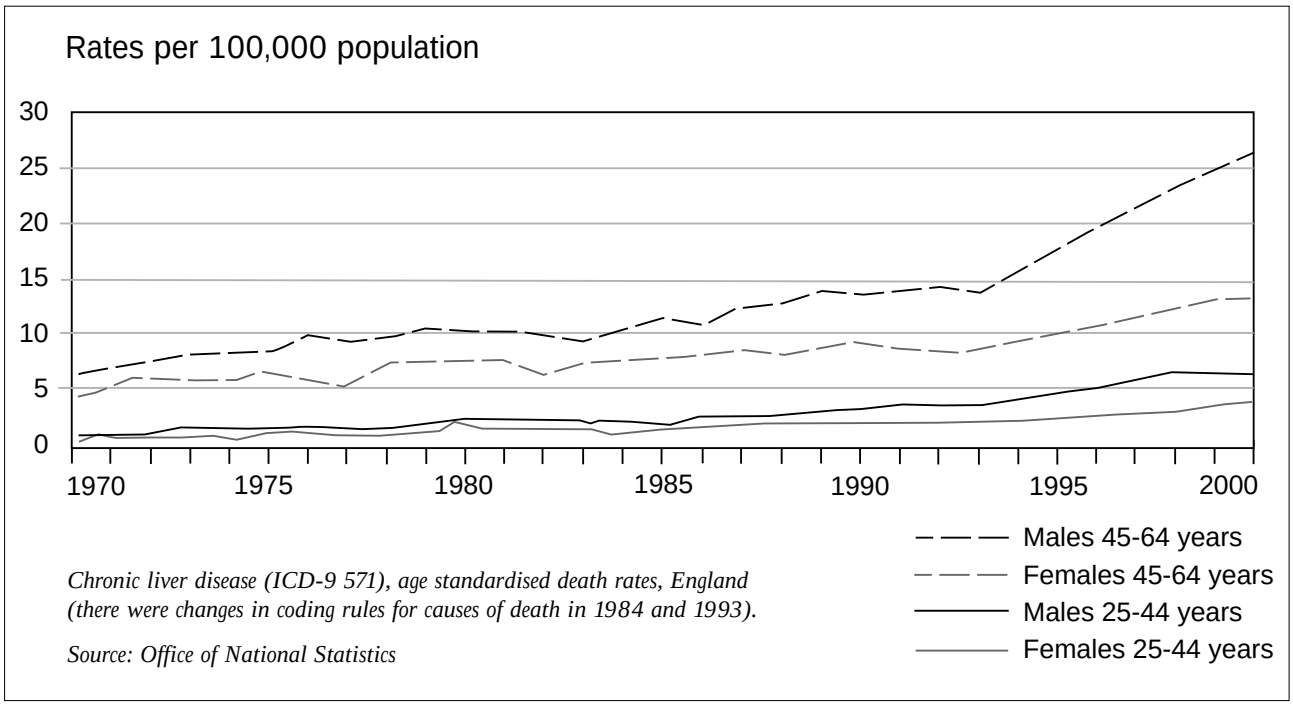
Source: Office for National Statistics

Figure 1 - *Alcohol consumption in the UK: 1900-2000. Per capita consumption of 100% alcohol*



Source: BBPA Statistical Handbook (2001)

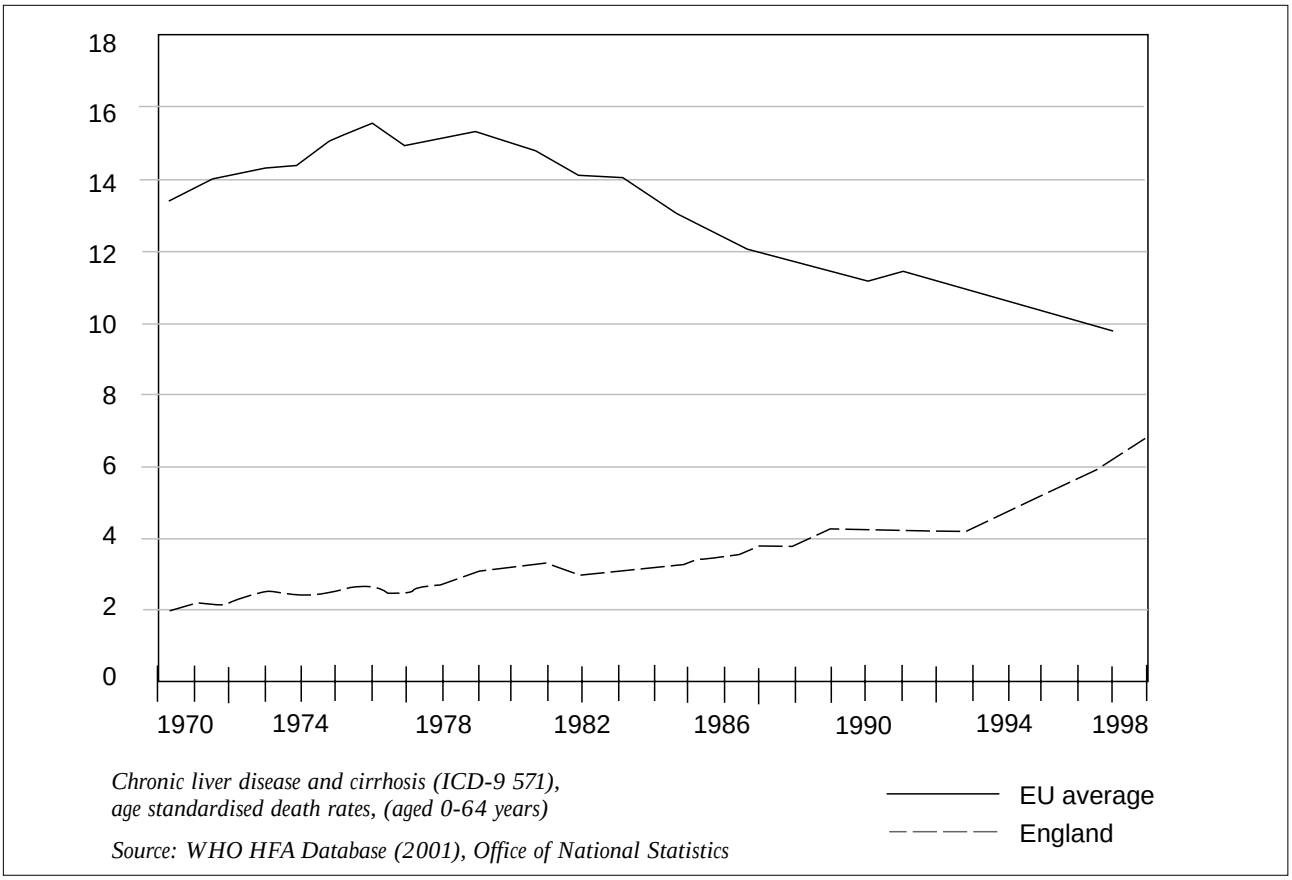
Figure 2 - *Rising trend in deaths from chronic liver disease: 1970-2000*



Chronic liver disease (ICD-9 571), age standardised death rates, England (there were changes in coding rules for causes of death in 1984 and 1993).

Source: Office of National Statistics

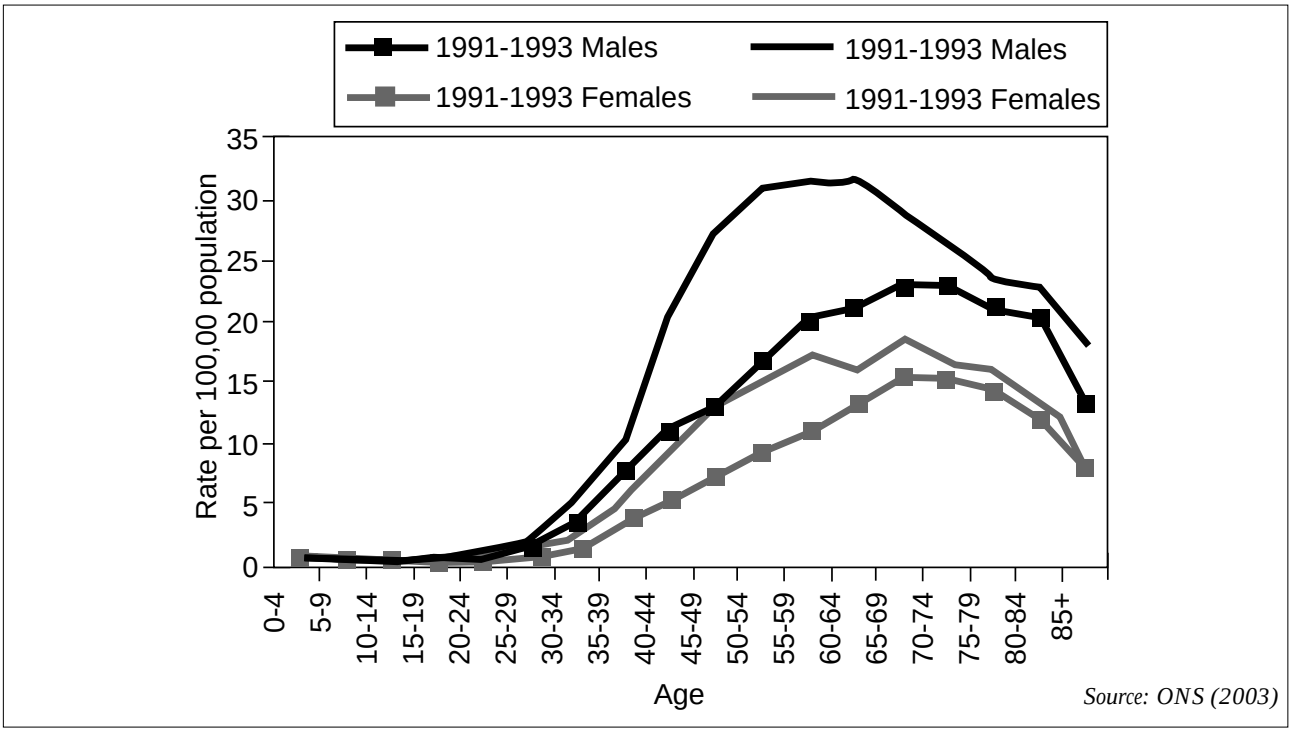
Figure 3 - *Changing death rates from cirrhosis in England and the EU: 1970-1998 (Rates per 100,000 population)*



Chronic liver disease and cirrhosis (ICD-9 571), age standardised death rates, (aged 0-64 years)

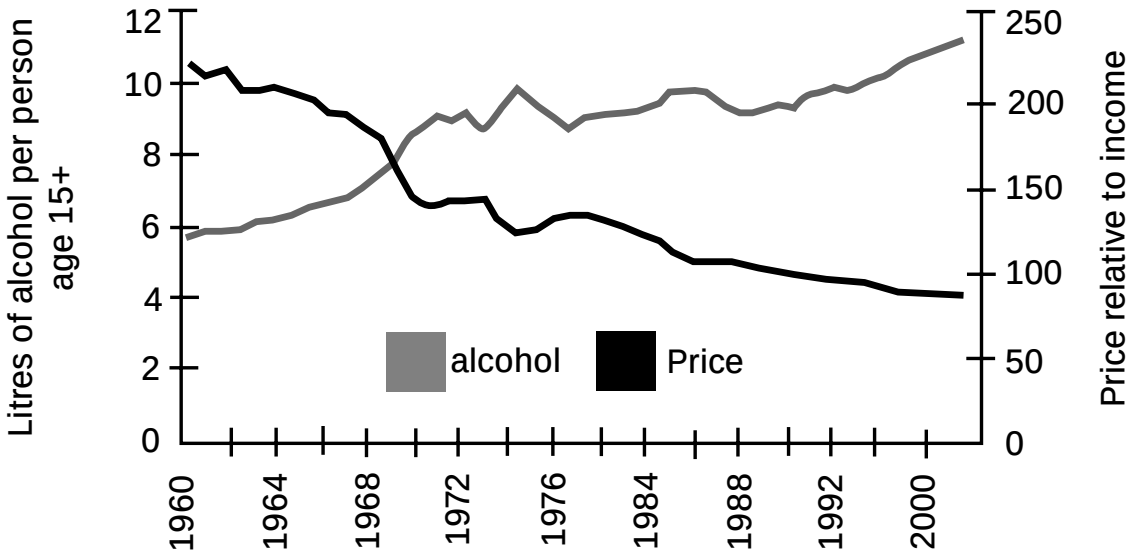
Source: WHO HFA Database (2001), Office of National Statistics

Figure 4 - *Age-specific alcohol-related death rates in England and Wales: 1991-2000*



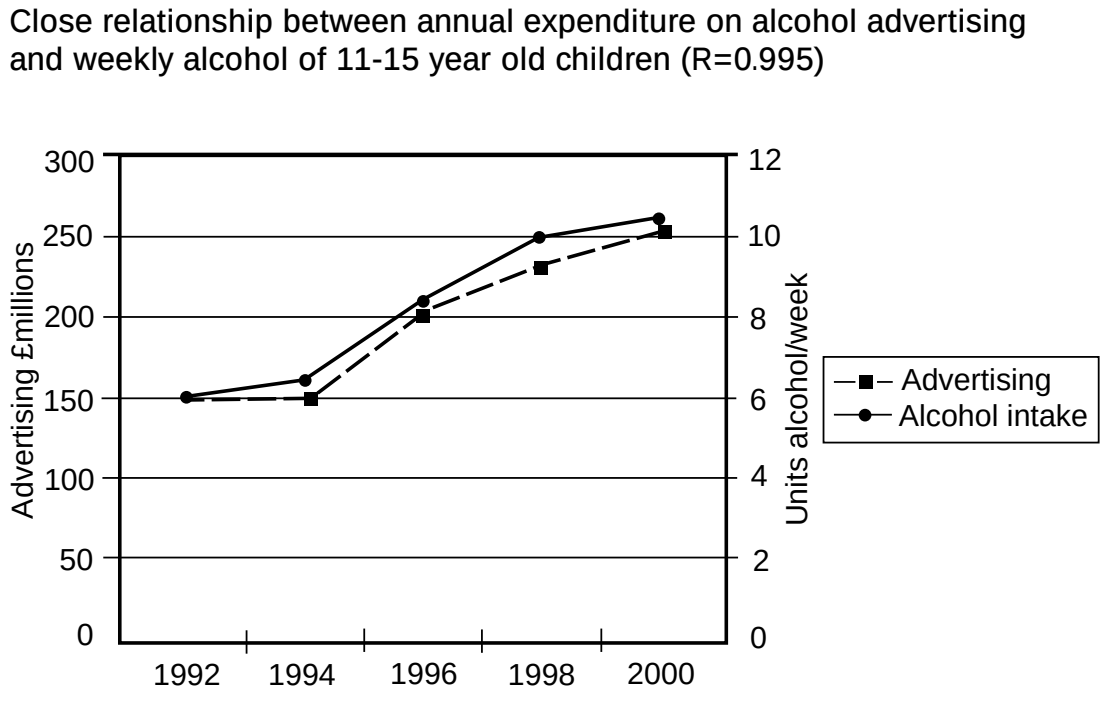
Source: ONS (2003)

Figure 5 - *Consumption of alcohol in the UK (per person aged 15+) relative to its price: 1960-2002*



Source: Tighe,2003

Figure 6 - *UK advertising expenditure at current prices and correlations with alcohol consumption in 11-15 year old children: 1992-2000*



Source: WARC (2002); Jernigan (2001), Cooke et al. (forthcoming)

Chapter two - *Do changes in population level drinking lead to changes in alcohol-related harm? Review of the new evidence*

2.1 This chapter reviews the latest evidence of the relationship between changes in population levels of alcohol consumption and changes in alcohol-related harm. There are two main questions. First, is the overall level of alcohol consumed related to the proportion of heavy drinkers in contemporary populations? Second, and more importantly, are changes in overall consumption accompanied by changes in alcohol-related harm? Only demonstration of the latter will suffice as robust evidence for policy making.

2.2 The evidence considered here will add to existing reviews of the literature, such as those to be found in the 1975 report entitled: *'Alcohol Control Policies in Public Health Perspective'* (Bruun *et al.*, 1975), the 1994 book *'Alcohol Policy and the Public Good'* (Edwards *et al.*, 1994), and the 2003 book *'Alcohol: No Ordinary Commodity'* (Babor *et al.*, 2003). All these reviews cited evidence to support the notion that aggregate level drinking affected the distribution of drinking levels within populations and links were shown between the former and levels of harm. The 1994 review concluded: 'A substantial proportion of data demonstrate a relationship between the overall level of alcohol consumption in society and population rates of diverse types of damage, including somatic diseases resulting from long-term heavy drinking, accidents following acute intoxication, and criminal violence and suicide. Thus the evidence supports the notion that aggregate consumption has a bearing on public health and social policy.' (Edwards *et al.*, 1994).

2.3 Over the last decade a concerted effort has been made to address some of the key issues. Methodological techniques have improved and new data have become available. It is important to review data from contemporary populations and, in light of the potential cardioprotective properties of alcohol, evidence from populations where CHD has emerged as a main cause of death. It is therefore timely to revisit this topic. As stressed in the introduction to this Report, it is not being suggested that reducing average consumption is a panacea for all alcohol problems. Drinking behaviour is complex and more research is needed to understand the individual, social and environment factors involved in order to inform harm reduction strategies.

Is overall level of alcohol consumed related to the proportion of heavy drinkers?

2.4 There are many factors that influence drinking behaviour: whether we drink alcohol at all, when and where we consume alcohol and which type of alcohol we consume. Such factors include societal beliefs, attitudes, and cultures that shape our individual behaviour. A multidimensional series of promoters and inhibitors exist and these are dynamic forces, which change over our life course.

2.5 Despite this complexity, there is compelling evidence that populations act collectively in terms of their alcohol drinking such that increases or decreases in consumption are experienced by drinkers across the spectrum of drinking levels (Skog, 1991). This led to the development of a statistical formula to describe an apparently fixed relationship (Ledermann, 1956) and it was proposed that the formula could be applied to any population. Such rigid rules have been challenged and abandoned. Instead, the Academy's aim here is merely to explore whether an approximate relationship between the mean levels of alcohol consumed by a population and the proportion of heavy drinkers is found using contemporary data.

2.6 Using data from 52 centres in 32 countries, Rose reported a correlation of 0.97 between mean consumption and the proportion consuming more than 300ml of alcohol per week (Rose and Day, 1990). One way this could come about is that the consumption of heavy drinkers

contributes substantially to the average. The relation would therefore be an arithmetic one rather than conveying anything about the collectivity of drinking patterns. Using the median as a measure of average consumption allows an examination of this collectivity. Therefore, Colhoun *et al.* extended the analysis using regional level data from the Health Survey for England by showing that median consumption was also predictive of the proportion reporting heavy drinking and 'problem drinking' (Colhoun *et al.,* 1997). They conclude that factors that increase mean and median consumption are likely to result in an increase in heavy drinking and therefore alcohol-related problems. Importantly they show that mean consumption was not related to levels of abstention (r = 0.08, p = 0.8 for men and r= -0.29, p = 0.3 women). The association between median consumption in drinkers and the prevalence of abstention was of similar size. Therefore, any harm due to heavier drinking will not be offset by the cardiovascular benefits of abstainers becoming light drinkers. This work was recently updated using data from the Health Survey for England 1999 and 2001 (Primatesta *et al.,* 2002). As before, there were strong positive associations between regional drinking levels and the prevalence of heavy and problem drinkers, see Figure 7.

2.7 Such findings support the notion that the more a population drinks overall, the higher the prevalence of heavy and potentially harmful drinkers. They add to the evidence from earlier reviews (Bruun *et al.,* 1974; Edwards *et al.,* 1994). However, these data, being cross-sectional, are unable to demonstrate empirically that real changes in *per capita* consumption result in changes in the proportion of heavy drinkers. In the next section a summary is given of the recent body of work utilising time-series analyses of the relationship between *per capita* consumption and several indices of alcohol-related harm.

Are changes in consumption accompanied by changes in alcohol-related harm?

2.8 A recent project funded by the European Commission provides the most compelling evidence to date. The European Comparative Alcohol Study (ECAS) utilised data from the member states of the EU and Norway between 1950 and 1995 (Norström and Skog, 2001). Country specific time-series analyses were performed to relate mean alcohol consumption (obtained from sales data) to various indices of harm. Crucially, lag times were built into the models to reflect the fact that exposure to past alcohol consumption is important. Age and gender specific mortality rates were used. The team also pooled the European countries into three regions to explore the potential effects of modification of drinking culture. Southern European, predominantly wine drinking, countries were grouped as having high levels of *per capita* consumption. Central European, typically beer drinking countries, exhibited medium levels of consumption, and Northern European, predominantly spirit drinking countries, had the lowest *per capita* consumption. The methods used in the ECAS project were recently applied to Canadian data and the findings are also summarised here.

2.9 The ECAS team demonstrated direct and statistically significant relationships between changes in *per capita* alcohol and liver cirrhosis mortality in the majority of the 14 countries in their study (Ramstedt, 2001a). The effects were found to be strongest in Northern European countries and among the younger age groups. Using data from Canada a one litre increase in adult *per capita* consumption was associated with a 17% increase in male total cirrhosis and a 13% increase in female total cirrhosis. When only cirrhosis with mention of alcohol was considered, a one litre increase in adult mean consumption gave rise to a 30% increase in cirrhosis (Ramstedt, 2003). These results suggest that a change in overall level of drinking affects cirrhosis mortality in different drinking cultures as well as among different demographic groups. Given the exponential risk function between individual drinking and liver cirrhosis, such an aggregate link is only expected if *per capita* consumption reflects the intake among the high-risk group. It is the heavier drinkers that are most likely to succumb to liver cirrhosis and, therefore, when the mean alcohol consumption rises, the top end of the drinking spectrum must experience

increases in consumption in order to see increases in cirrhosis levels.

2.10 Using pancreatitis mortality as another index of harm, all 14 European countries investigated showed direct relationships with *per capita* consumption, and statistical significance was reached in 11 (Ramstedt, submitted, a). The magnitude of the association was uniform across most countries, with the effect of a one litre increase in consumption resulting in a 5 to 14% increase in pancreatitis mortality in most countries. In Sweden and Norway the increase was as much as 30%.

2.11 Skog conducted a series of analyses looking at accident mortality and in particular traffic accidents, accidental falls and other accidents (Skog, 2001a and 2001b). In general, age-specific accident death rates were directly related to *per capita* consumption, although these relations mostly did not reach statistical significance for the United Kingdom. There were considerable country differences, probably reflecting cultural differences in intoxication. The effects were larger in Northern European countries, followed by Central and then Southern countries. The effects were four times larger among men than women. The association between aggregate alcohol consumption and rates of fatal accidents was mainly due to traffic accidents in Central and Southern Europe, and to falls and other accidents in Northern Europe. These findings were corroborated using data from Canada (Skog, 2003).

2.12 Weaker, and less consistent associations were found between population consumption of alcohol and levels of suicide (Ramstedt, 2001b). *Per capita* consumption was directly related to suicide most often in Northern European countries. In six of the 14 countries included in the analyses, inverse (negative) associations were found among men (Austria, Denmark, the Netherlands, the UK, Italy and Spain). For this index of harm, it was thought that cultural factors (such as drinking patterns and systems of social control on heavy drinking) are more important than *per capita* alcohol consumption.

2.13 Alcohol sales were directly and statistically significantly associated with murder in five of the 14 countries (Finland, Ireland, Portugal, Spain and Sweden) and no significant inverse relationships were found. Estimates tended to be of larger magnitude in Northern European countries and effects were stronger for male victims (Rossow, 2001). This is supported by a previous study showing a significant correlation between changes in alcohol consumption and rates of violent deaths in post-war Norway (Skog, 1986). A significant strong association between regional mean alcohol consumption on social harm was also recently demonstrated using data from the Health Survey for England and official statistics on regional rates of criminal damage but not violence against the person (Primatesta *et al.*, 2002).

2.14 Numerous individual level studies have found a cardioprotective effect of alcohol for men over 40 years and women past menopause. Benefit is apparent at a consumption level of a drink every second day and there appears to be no additional benefit from drinking more than one to two drinks per day (Bondy *et al.*, 1999). On the other hand, sporadic heavy drinking raises the risk of CHD (Murray *et al.*, 2002). Because of the double edged relationship of alcohol and heart disease, these prospective studies of individuals do not give guidance on what happens to the rates of CHD as the level of drinking changes in the population as a whole. The relationship is likely to be complicated as it depends on the alcohol-related risk function and the proportion of abstainers in a population. If the relationship is L-shaped, so that most benefit is conferred by low levels of drinking and there is no additional benefit from drinking more, relatively greater effects of increases in alcohol consumption on CHD in populations characterised by low *per capita* consumption would be expected. If the relationship is U-shaped, so that there is an increased risk of CHD among heavier drinkers, then there may be trade-off between the benefits and risks as *per capita* consumption increases.

2.15 A review of earlier population level evidence, mainly from cross-sectional data, found that these studies generally show a strong inverse association between consumption of wine and mortality from heart disease, while the association was weaker or

non-existent for spirits and beers (Rimm, 1996). But new time-series analyses, adjusted for smoking and with lag time effects built into the models, for 14 European countries, found a random distribution of non-significant alcohol effect estimates (Hemström, 2001). The exception being a significant direct relation between increased consumption and increased heart disease mortality in Spain. Using similar time-series methods and looking at beverage specific effect, Ramstedt showed that in Canada a one litre increase in *per capita* alcohol consumption was followed by a small increase in male CHD of about 2% (Ramstedt, submitted, b). This effect was mostly related to spirits consumption, whereas wine was associated with lower CHD rates.

2.16 These new findings suggest that although an individual level relationship between alcohol consumption and heart disease exists, at the population level this effect is swamped by other factors, such as changes in other risk factor prevalence and treatment effects. Moreover, in England, as mean consumption increased, abstinence prevalence has not decreased, see Table 2. This suggests that any reduction in *per capita* consumption will not have a deleterious effect on the population impact of alcohol's cardioprotective properties.

2.17 Several attempts have been made to estimate total mortality, in terms of net number of deaths caused by, or prevented by, alcohol using population attributable fractions (English *et al.*, 1995; Single *et al.*, 1999; Britton and McPherson, 2001) and most find small net beneficial effects, with the reduced deaths from heart disease attributed to drinking at older ages outweighing the deaths from injuries and other causes, mostly at younger ages. However, if potential years of life lost are considered instead of counts of deaths, a net detrimental effect has been shown, due to the contribution of violent and accidental deaths at young ages (52,412 male and 22,724 female annual potential years of life lost up to age 65 years in England and Wales) (Britton and McPherson, 2001).

2.18 But such studies are not able to demonstrate how mortality rates actually respond when *per capita* consumption really changes. Using time-series data from the 14 participating countries in the ECAS project, Norström reported significant increases in all-cause male mortality as *per capita* consumption rose in eight of the countries (though not in the UK), and in none was the effect inverse (Norström, 2001). The effect tended to be stronger in low-consumption countries (3% increase in mortality per litre of alcohol increase *per capita*) than in medium and high-consumption countries (1%). Similar findings were reported when using Canadian time-series data (1.7% increase in mortality given a one litre increase in consumption) (Norström, submitted). Since female all-cause mortality was used as a control in these analyses, as a proxy for uncontrolled confounders, no estimate can be made from them of effect for women. However, there is a clear tendency in the findings for the alcohol consumption level to be related to excess male alcohol mortality, though it should be recognised that the effects of alcohol on all-cause mortality are less than those from other causes such as smoking prevalence and dietary factors. Again, Norström's analysis is in terms of deaths rather than of years of life lost, whereas alcohol's adverse effects tend to cause mortality at younger ages than other causes.

2.19 In summary, the ECAS and Canadian findings demonstrate that in contemporary Western developed countries, *per capita* consumption stands out as a crucial determinant of alcohol-related harm. The indices of harm range from social phenomena such as criminal damage and acts of violence to somatic illnesses such as liver cirrhosis and pancreatitis. This literature, based on improved methodology, endorses that reviewed previously by Bruun *et al.* (1975) and Edwards *et al.* (1994).

2.20 Social, behavioural and biological determinants of drinking behaviour are important. When comparing different countries, it was shown that the impact of changes in population levels of alcohol appeared to be amplified or mitigated depending on the drinking culture and its pattern. Larger effects tended to be found in countries with comparatively low average consumption, but with a tendency towards heavier drinking sessions. The importance of pattern of drinking on alcohol-related harm at a population level was

recently shown using data from Eastern Europe. The mean alcohol consumption level is higher in Poland and Czechoslovakia than it is in Russia, but the number of reported binge drinking sessions and levels of alcohol-related harm are higher in Russia (Bobak *et al.*, in press). More research is needed into the social determinants of drinking and its consequences as there is evidence of a social gradient in alcohol-related harm, despite a fairly uniform mean alcohol consumption across the social spectrum (Marmot and Feeney, 1999). There may be sections of society that are immune to attempts to reduce *per capita* consumption, or resort to deviant behaviour in order to maintain their drinking, such as smuggling or home-distilling. However, the fact that reductions in mean consumption are accompanied by reductions in deaths from liver cirrhosis suggest that at least some of those heavier drinkers most at risk are affected by population drinking levels.

Conclusion

2.21 There is compelling evidence, from many populations, that overall level of alcohol consumption is linked with the prevalence of heavy drinking and that changes in *per capita* consumption are associated with changes in the level of alcohol-related harm. Mortality related to drinking tends to occur at a relatively young age (Britton and McPherson, 2001); such deaths are often especially poignant, as well as costly for the society. At the individual level, the harm from drinking is partly counterbalanced by the substantial evidence for a protective effect of frequent light drinking on heart disease. But at the population level, the available evidence is that the extent of the cardio-protective effect is not influenced by changes in the population's drinking level. On the other hand, there is clear evidence that rates of a number of different causes of death would be reduced by a decrease in consumption.

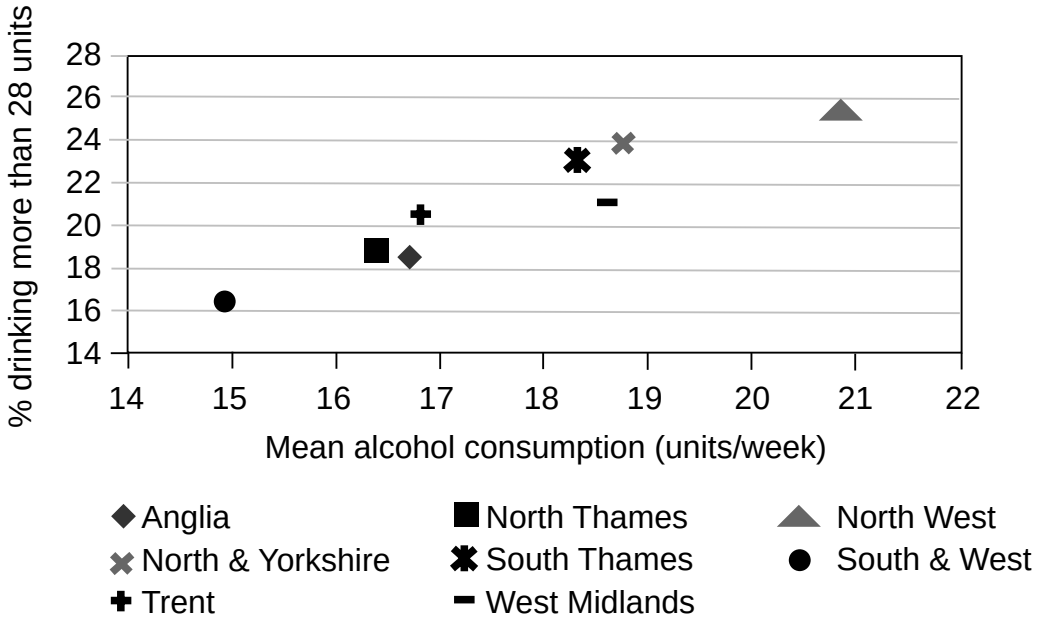
2.22 A responsible alcohol strategy cannot ignore the wealth of evidence that indicates that levels of alcohol-related harm are influenced by the overall consumption of a population. This conclusion has been endorsed by several prestigious institutions (e.g. Royal College of Physicians, 2001; The Society for the Study of Addiction, 1999 (Raistrick *et al.*, 1999); Alcohol Concern 1999; The Institute of Alcohol Studies, 1999).

Table 2 - *Abstinence rates in the UK and population alcohol consumption*

Year	% abstainers Men	% abstainers Women	Consumption per person aged 15+ years (litres of alcohol/person)
1980	5	12	9.4
1990	6	12	9.8
2001	8.7	14.7	10.7

Source: Abstinence estimates from General Household Survey and Health Survey for England (Office of National Statistics)

Figure 7 - *Relationship between mean alcohol consumption and prevalence of drinking more than 28 units (approx 224grams) of alcohol per week: Men*



Source: Primatesta et al., 2002

Chapter three - *Reducing the harm from drinking*

3.1 Having reviewed current evidence on the clear link between population level alcohol consumption and harm in that population, the Report now looks at how this might be translated into policies that reduce that harm.

Implications of the nature of alcohol problems for preventive strategies

3.2 In order to develop effective policies, the various ways in which alcohol misuse damages the individual and society must be understood. Three main mechanisms link drinking to social and health problems (Babor *et al.*, 2003): toxicity, dependence and intoxication. A pattern of heavy drinking over time may result in toxicity to many organs of the body, and also often leads to problems in family, work, and other social roles. Over time, this drinking pattern may also result in alcohol dependence, which then becomes a mechanism by which the pattern of heavy drinking and harm is sustained despite the occurrence of harm. The third mechanism, intoxication, is primarily related instead to the amount and mode of drinking on a specific occasion. Intoxicated occasions are common for those with a pattern of sustained heavy drinking, and for those who are dependent. However, they are also much more widely spread in the general population of drinkers, particularly among young adults. The target group in preventing problems of intoxication is thus much broader than those who are dependent or inveterate drinkers.

3.3 Intoxication causes a substantial burden of health, as well as social problems. Alcohol-related injuries are primarily attributable to intoxication, and Britton and McPherson's analysis (2001) suggests that 29% of deaths attributable to alcohol are from injuries, both unintended and intentional. The health burden from intoxication is particularly heavy among teenagers and young adults. Thus Britton and McPherson find that injuries predominate among the causes of alcohol-attributable death for those aged 16-34 years. Alcohol-related attendances are a substantial preventable burden on A&E. A study in a Liverpool hospital found that 12% of all A&E attendances were alcohol-related (Pirmohamed *et al.*, 2000); and the Report has already quoted that the PMSU interim report estimates the proportion for the UK as a whole may be up to 35% (PMSU, 2003). A recent consultation with UK emergency health service workers found they expressed great frustration with the impact of intoxication on their work; in their view, the services were expected 'to deal with the effects of what is actually a massive societal problem' (Alcohol Harm Reduction Group, 2003).

3.4 To prevent chronic health problems from drinking, there is little alternative to reducing the underlying sustained heavy drinking, which is often complicated by alcohol dependence. In contrast there are more options for preventing injuries and other problems from occasions of intoxication (Room, 1975). Besides preventing the intoxication itself, the harm can also be minimised by altering the social or physical context of the drinking occasion and its aftermath. Thus, measures such as controlling the circumstances and pace of drinking, providing shatter-proof glasses in pubs, and extending the running hours of public transport, can all potentially play a part in preventing harm from intoxication.

Targets and effects of preventive strategies

3.5 Strategies to reduce alcohol-related problems are commonly divided into those that apply to the population of drinkers in general and those directed at specific high-risk drinking contexts, patterns, or groups. However, in practice the distinction is not so clear. A measure with general effect may still have a differential impact. Thus, increased taxes on alcohol affect all drinkers to some extent, but the increase will have a greater impact on the wallet of a heavier drinker than of a lighter. Strategies with general application may have particular effect on the health of high-risk drinkers. For instance, when beer was made much more widely available in Finland in 1969, deaths from alcohol-specific causes rose more

rapidly than the general level of alcohol consumption (Mäkelä *et al.,* 2002). In the Russian anti-alcohol campaign of 1985-1988, which is estimated to have reduced total alcohol consumption (including unrecorded alcohol) by about 25%, deaths from alcohol-specific causes fell by 54% (Shkolnikov and Nemtsov, 1997; Leon *et al.,* 1997). Conversely, strategies directed at a specific high-risk behaviour often turn out to have more general effects. Thus, the recent French enforcement campaign against drinking-driving is reported to have reduced road deaths by 20%, but is also regarded as the cause of a drop of 15% in wine sales in restaurants (Associated Press, 2003).

3.6 The actual reach and differential effects of a prevention strategy are thus matters for empirical investigation rather than for assumption. While the intended target of a particular strategy may be of political importance, such intentions may not be a good guide to the practical effect of the strategy.

The effectiveness of different strategies of prevention

3.7 The international research literature contains clear lessons about what is effective in reducing rates of alcohol-related problems, as against what has little or no effectiveness (Babor *et al.,* 2003).

3.8 *Education and public information*
Unfortunately, in general it is difficult to show any lasting effects from educational and public information approaches (Foxcroft *et al.,* 2003). Part of the lack of effectiveness in the evaluation studies may reflect the constraints of what is politically popular or possible to implement. Educational programmes are most commonly limited to school-based persuasion, although it is clear that programmes addressed only to teenagers, without attention to adult drinking, are unlikely to succeed (Bonnie and O'Connell, 2003). There are some encouraging results emerging from the approach of cognitive-behavioural skills-based training programmes (Larimer and Cronce, 2002). The lack of demonstrated effects of public information approaches may reflect that: they have operated within political constraints; have tended to be relatively short-term and have been much less intensive than alcoholic beverage advertising.

3.9 Education and public information approaches can be used not just to seek to persuade the individual drinker to change his or her behaviour, but also to mobilise public support for prevention approaches that have demonstrated effectiveness (Casswell and Gilmore, 1989). They include limiting the availability of alcohol, drinking-driving countermeasures, and regulation and harm reduction in and around drinking environments.

3.10 *Advertising controls*
There is evidence that alcohol advertising affects attitudes and behaviour, especially in the young (Saffer, 2002). Among young people, more exposure to alcohol advertising:

- increases positive beliefs about alcohol and drinking;
- reduces perception of risk;
- shapes perception and encourages pro-drinking attitudes;
- shapes perceptions about acceptable levels of alcohol intake (upwards);
- increases consumption (Casswell and Zhang, 1998; Casswell *et al.,* 2002).

3.11 The use of advertising bans is a controversial area. However, there is concern that current restrictions on the scope of advertising alcoholic beverages are already breached (Royal College of Physicians, 2001). There is recent evidence that banning advertising can be effective (Saffer and Dave, 2004). Furthermore, there is also evidence that hard-hitting counter-advertising can be effective for both alcohol and smoking (Agostinelli and Grube, 2002; Agostinelli and Grube, 2003).

3.12 *Limiting the availability through taxes and other influences on price*
This is one of the most important areas in which the national *per capita* consumption is likely to be amenable to change and a resulting reduction in harm achieved.

3.13 In Chapter 1 the Report gave evidence to show the increase in the affordability of alcohol that has occurred over recent decades and consumption has closely tracked this rise in affordability (Raistrick *et al.*, 1999). Increasing the tax on alcoholic beverages to restore the affordability level of 1970, and indexing the taxes to disposable income, would be a highly effective way of turning around not only the trend in alcohol consumption but also trends in alcohol-related harm. Tax increases have been shown to impact on rates of cirrhosis mortality, drink-driving deaths, and violent crime (Cook, 1981; Cook and Moore, 1993). There is clear evidence that heavy drinkers are more affected than other drinkers, at least in absolute terms of numbers of drinks forgone, by changes in the tax level. Tax increases also appear particularly to affect the drinking of underage drinkers (Babor *et al.*, 2003).

3.14 A recent Customs and Excise study (Huang, 2003) has developed new models of demand for alcoholic beverages in the UK as of 1995. The elasticities estimated are the calculated influence of price on the purchase of different beverages, and are: -0.48 for beer consumed on-premises (i.e. a 1% increase in price would lead to a 0.48% decrease in beer consumption); -1.03 for off-trade beer; -0.75 for wine; and -1.31 for spirits. These elasticities imply that a tax rise would be highly effective in controlling consumption of beer, wine and spirits purchased from off-licenses, and would affect on-premise beer consumption (mainly in pubs) somewhat less, though still substantially.

3.15 On the basis of Huang's estimates, and estimates of the effects of the resulting drop in alcohol consumption (Norström *et al.*, 2002), a 10% rise across the board in the prices of alcoholic beverages in the UK should produce a drop of 7.0% in male and 8.3% in female cirrhosis mortality, a drop of 5.0% for male victims and 7.1% for female victims of homicide, and a drop of 28.8% for male and 37.4% for female deaths from explicitly alcohol-involved causes (alcohol dependence, poisoning, etc.)

3.16 *Traveller's allowances and tax levels in the EU*
The combination of low alcohol taxes in other EU member states and the extremely generous traveller's allowance for carrying alcohol across EU borders has caused a substantial increase in alcohol consumption that is not included in the official statistics and which is purchased at lower prices than in the UK. The current official estimates for 2000, based on such sources as the Expenditure and Food Survey, amount to about 0.85 litres per adult per year attributable to cross-border shopping and smuggling (calculated from HM Customs and Excise, 2002a). Leifman's analysis (2001) pointed to a steep rise in the last decade; the growth of alcohol-related mortality between 1993 and 1997 implied a rise in unrecorded alcohol consumption by almost half in the UK in that period. Respondents to a UK population survey in 2000 reported bringing in alcohol as travellers which amounted to an average of 1.1 litres of pure alcohol per adult per year (Leifman, 2001). These data for travellers' imports do not include professionally smuggled alcohol, much of which makes its way into retail shops or pubs, and is becoming part of normal trading, mingled 'in among legitimate stock' and sold on in 'wholesale and retail ... shops and off-licenses' (HM Customs and Excise, 2002b).

3.17 The EU's standard 'guidance' on what a traveller is allowed to carry across EU borders without paying excise tax is ten litres of spirits and 20 litres of fortified wine and 90 litres of table wine and 110 litres of beer. If we think of a regular heavy drinker who is drinking the equivalent of a bottle of wine a day, this amount corresponds to a 272-day supply. In contrast, the cigarette allowance is 800 cigarettes; for a smoker with a 20-cigarette-per-day habit, this would be a 40-day supply (Europa, 2003). Expressed in terms of the recommended UK weekly limit of 21 units for a male and 14 units for a female, the EU's guidance levels for alcohol amount to a two year supply for a male drinking at the maximum 'sensible' level and a three year supply for a woman.

3.18 This present 'guidance' on what constitutes a personal supply is deeply against the interests of public health, including the Government's guidelines on personal drinking limits. In the interests of public health, the UK guidance on alcohol importation for personal use should be reduced to an amount that more reasonably could be expected to be a personal supply - something

like three litres of spirits or six litres of fortified wine or ten litres of table wine or 20 litres of beer. From a public health perspective, it is also appropriate for the Government to continue to resist pressure from the EU Commission to loosen its surveillance and enforcement of the cross-border smuggling and the 'white van trade' (Osborn and Elliott, 2002).

3.19 The basic cross-border problem is that alcohol taxes are so low in many other countries of the EU. After a 20 year process, the EU adopted a directive on harmonisation of alcohol taxes in 1992; efforts since then to reach a real harmonisation of rates have so far failed (for the most recent efforts, see http://europa.eu.int/comm/secretariat_general/index_en.htm). The harmonisation was largely fictional, since the minimum rate for wine taxes was set at zero, the level at which seven EU member states have kept it. In the interests of public health, there is a need for the relatively high-tax jurisdictions, including the UK, to push for an increase in the minimum EU tax levels on alcoholic beverages. There will be support for this elsewhere in the EU: the Netherlands raised its alcohol taxes by 20% last year (Zimmerman, in press), and the Nordic countries face the prospect otherwise of having to abandon their high-tax regimes because of the cross-border trade.

3.20 *Minimum purchase age laws*

Among the best-supported findings in alcohol policy research is the conclusion that increasing the minimum age for purchasing alcohol has an effect in reducing harms from drinking in the affected ages (Wagenaar and Toomey, 2002; Shults *et al.*, 2001). While much of this literature is from the United States, which now has a relatively high minimum age of 21, there are also studies from such countries as Canada and Denmark, with lower age limits, which also show effects (e.g. Møller, 2002). Establishing a uniform minimum purchase age of 18 in the United Kingdom can be expected therefore to have a beneficial public health effect.

3.21 *Alcohol-specific sales outlets*

Availability of alcoholic beverages in the UK in the bottle or can has been transformed in recent decades by permitting the sale of alcoholic beverages from supermarkets and convenience stores. A further dimension of availability has been added by the shift to the '24/7' society, so that shops selling, among other goods, alcoholic beverages are open for long hours every day. The wide variety of outlets selling alcoholic beverages provides an opening for illicit alcohol to come into the market (HM Customs and Excise, 2002a), and for sales to customers under the legal age, often by check-out staff of about the same age.

3.22 There is clear evidence in the literature on the effects of changing the number and type of off-licenses. Alcohol consumption rose by almost half in the year after beer was made available for sale in grocery stores in Finland (Mäkelä *et al.*, 2002). Time-series analyses found a 16% increase in wine consumption and a 5% increase in total alcohol consumption in New Zealand when grocery stores and supermarkets were added as sales outlets for wine (Zhang and Casswell, 1999). Restricting off-premise alcohol sales to alcohol-specific outlets, specifically licensed, would provide much better control of the conditions of alcohol sales, and would be a particularly effective means of reducing the supply to under-age purchasers.

3.23 *Alcohol license enforcement officers*

The police have many responsibilities, and it is no surprise that enforcing regulations on alcohol licensing and sales often rank fairly low on the list. International experience strongly suggests that regulation and surveillance by a dedicated licensing and inspection service for licensed premises, covering both on and off-licenses sales, greatly increases the compliance with regulations and prohibitions on alcohol sales. In line with this, the Netherlands recently set up such a dedicated alcohol control service, with about 70 inspectors (Zimmerman, in press). A recent study found that a programme combining stricter enforcement of alcohol sales laws and training in responsible beverage service had a significant effect in reducing the rate of violent crimes between 10 pm and 6 am (Wallin *et al.*, 2003).

3.24 *Limiting hours and days of sale*

Under the new licensing legislation, the issue of pub and nightclub opening hours becomes a local

matter. There is strong evidence in the research literature that increasing the opening hours in the late evening is associated with increased rates overall of consumption and problems (Chikritzhs and Stockwell, 2002; Ragnarsdóttir *et al.*, 2002; Babor *et al.*, 2003). This evidence needs to be made available in a convenient form to local councils and licensing committees, and more broadly to the public. Recent British studies, discussed below, have underlined the increasing problems from intoxication at the heart of the night-time economy in many British cities and towns (Hobbs *et al.*, 2003; Chatterton and Hollands, 2003). These problems are likely to be exacerbated by extending or unlimited closing hours.

3.25 The decentralisation of decisions about opening hours both in Scotland and in England and Wales opens a research opportunity for further studies in the UK of the effects of changes in opening and closing times. Central government support should be given to such evaluations, so that lessons learned can be documented and the results diffused nationally.

Drink-driving countermeasures

3.26 *Lowering the maximum Blood Alcohol Level (BAL)* Britain, with a BAL of 0.08% is, along with Ireland and Luxembourg, an exception to the general EU rule of a BAL of 0.05%. The other exception is Sweden, which has a BAL of 0.02%. The advantage of a 0.02% level is that it offers a very clear rule to the ordinary drinker: if you have had anything to drink at all, you should not drive. An evaluation of the effects of the Swedish change showed that lowering the level to 0.02% even from the level of 0.05%, in combination with other measures, had a significant effect on drink-driving fatalities (Borschos, 2000).

3.27 On this matter, the UK is out of step with the rest of Europe and with the clear findings of the research literature. The research findings are that reducing the British BAL will reduce rates of traffic casualties.

3.28 *Random Breath Testing (RBT) and graduated licensing* The Australian experience with RBT is unequivocal: it is an effective strategy in reducing rates of drink-driving, when it is made routinely and widely effective. It also suggests that the main problem with sustaining the strategy is convincing the police that they are being effective when they are not catching anyone. Graduated licensing rules for new drivers, including a zero alcohol standard when driving, have also been shown to be effective in North American evaluations (Babor *et al.*, 2003). For random breath testing to have a lasting effect, it needs to be implemented with a substantial and sustained level of effort, for instance so that each driver should on average be stopped at least once every two years.

Regulation and harm reduction in drinking environments

3.29 Recent years have seen the transformation of the night-time economy in British cities and towns (Hobbs *et al.*, 2003; Chatterton and Hollands, 2003). Local councils seeking to revive the centre of de-industrialised cities saw the growth of the night-time economy as an engine for economic and cultural development. Instead of their vision of a local cultural flowering, what they have got, in city after city, are crowds of drunken and rowdy young people on weekend nights. Old-fashioned pubs have been replaced by large branded drinking warehouses run by national or international chains. As Hobbs *et al.* (2003) note, in recent years 'town planners and city managers [have begun] to admit to the harsh reality that lies beyond the glossy rhetoric of the 24-hour city: that the night-time economy is ... dependent upon hedonistic drives cultivated in the alcohol/youth nexus'. The 'alcohol-fuelled night-time economy' becomes a venue for displays of male aggression, with assault rates rising along with the increased total capacity of the drinking places. In Manchester City Centre, for example, the capacity of licensed premises increased by 240% between 1998 and 2001, whilst the number of assaults reported to the police increased by 225% between 1997 and 2001 (Hobbs *et al.*, 2003).

3.30 The growth of the night-time economy has contributed greatly to the burden of alcohol-related cases on the emergency health services. As a paramedic put it in a recent study: 'the alcohol abuse, certainly the violent side of it, becomes a

real problem on Thursday, Friday and Saturday nights... 90% of my time is taken up with dealing with the results of drink, whether that be vomiting young kids or violence.' (Alcohol Harm Reduction Group, 2003).

3.31 Policy responses, at the National Government level, to these trends have focused on initiatives based on the 'bad apple' theory - that the problem is one of individual proclivity for violence, and can be solved by local banning orders on individual drinkers (e.g. Home Office, 2003).

3.32 At the local level, the response is often broader-gauged, but still constrained by the new realities that the pursuit of developing the night-time economy have created. Hobbs *et al.* (2003) state: 'When faced with questions of what is to be done to reduce problems of violence and disorder, the typical refrain is to call for the promotion of a more diversified leisure provision... The stance, in our experience, is usually adopted after several years of rapid and uncoordinated expansion and a concomitant rocketing of street violence and disorder. Thus new regulatory controls often come to be developed in response to problems that the planners and policy-makers themselves helped initially to create.'

3.33 Furthermore, there is a danger that the central guidance on local implementation of the alcohol licensing powers now being transferred to committees of local councils will constrain local councils from responding appropriately to the problems they find around local pubs and nightclubs.

3.34 *Server training, regulation and liability*
The international literature shows clearly that server training and clear house rules on refusing service to those who are already intoxicated can be effective in reducing rates of service, and of such sequelae as drink-driving casualties, if such programmes are backed up by regulatory enforcement (Babor *et al.*, 2003). There are also promising results from a controlled trial of staff training in reducing pub-related violence (Graham *et al.*, 2003). Making servers and their establishment liable for the damages caused by those served who are under-age or already intoxicated has also proved to be an effective extension of British common law in the US, Australia and Canada, and could be applied in Britain (Goodliffe, 2003). It has the further advantage of encouraging effective server training, and of making insurers deeply interested in house policies and practices on unlawful serving.

3.35 *Coordination of public transport and closing times*
'Joined-up' thinking about alcohol requires taking into account the relationship between patterns of patronage and closing times, on the one hand, and hours of operation of public transport, on the other. To facilitate the operation of the '24-hour city', while keeping the closing hours of public transport at midnight, is to invite trouble, and particularly to make drink-driving almost inevitable. It might be considered appropriate to charge businesses that remain open in what used to be called 'unsociable hours' not only for the extra costs of policing and emergency services in those hours, but also for the costs of keeping public transportation operating.

Building an effective strategy

3.36 Studies of the cost-effectiveness of different alcohol interventions are just now becoming available (e.g. Ludbrook *et al.*, 2001; Chisholm *et al.*, 2003). It would be wise to take such analyses into consideration. Chisholm *et al.*, (2003), for instance, estimate that implementation of full enforcement of drinking-driving legislation, including random breath testing, would reduce traffic deaths in Western Europe by 23% among men and 4% among women. According to their estimates, the highest cost-effectiveness ratios for Western Europe, in a consideration of five strategies shown to be effective, are for RBT, brief physician advice, and restrictions on access such as closing on a weekend day. If the Government revenue gain from increased taxation were counted in the ratio, alcohol taxation would join the list.

3.37 The Report has considered above only a limited range of the whole spectrum of potential measures to reduce rates of alcohol-related problems. It has focused particularly on strategies where there is the greatest evidence of effectiveness: price and taxes; limiting hours and days of sale and otherwise restricting availability; drink-driving

countermeasures, particularly lowering the BAL and random BAL testing; and harm reduction in drinking environments. Even this limited range, however, extends across the jurisdiction of many government departments and different levels of government. It also takes us outside the normal range of concern of a body such as the Academy of Medical Sciences. But such a broad reach is necessary to build an effective strategy to reduce alcohol-related problems. The impacts of alcohol on health are various, with both occasions of intoxication and inveterate heavy drinking playing important roles. To reduce the burden of alcohol on British health, there is a need to press on several fronts: the prevention of intoxication in hazardous situations (such as before driving) and the reduction of intoxication go hand in hand with the urgent need to reduce the overall level of drinking.

Chapter four - Conclusions and recommendations

Core conclusions

4.1 *Britain's alcohol consumption and the harm that goes with it has increased sharply*

Suppose a poll had been taken of British adults in 1970. Is it likely that people would have offered the opinion that society would be better off if the alcohol consumption of the population rose by 50%? The Academy knows of no such poll, but would be surprised if that were the case. Yet that is what has happened. Mean consumption of alcohol for people 15+ was 7.1 litres a year in 1970, whilst it was 11.1 litres in 2002. If we go back a further decade to 1960 we find that alcohol consumption doubled between 1960 and 2002. The evidence reviewed in this Report suggests that society has suffered as a result, with an increase in medical conditions linked to alcohol, violent deaths, civil disruption, and personal suffering. Increasingly, it has been young adults who bear the brunt of this harm.

4.2 *Alcohol consumption must have a place in alcohol policies*

A strategic approach to the reduction of alcohol-associated harm that targets heavy drinkers must be complemented by an approach that seeks to lower total alcohol consumption in the population as a whole. Were it likely that alcohol problems could be reduced solely by targeting at-risk drinkers there would be no need to attempt to change average population consumption. But, the evidence shows that a lower average alcohol consumption of the population is likely to lead to a lower burden of alcohol-associated problems.

4.3 Increases in alcohol consumption are not an inevitable part of social change and growing affluence. Italy provides a telling contrast to the UK. Average alcohol consumption per person aged 15+ was 21 litres a year at its peak in 1968 (three times the British level) and declined steadily to a low of 9.2 litres in 2000 (below the British level). Why this happened is not clear. It is thought to be part of a general cultural change. Yet, international evidence shows that the means exist to influence the average level of consumption of the population: price and availability.

4.4 *Reducing national alcohol consumption will not reduce the heart benefits for the population*

Alcohol is a good friend and a bad enemy (Worpole, 2003). In addition to its place in our culture and economy, alcohol provides health benefits, most notably a reduction in risk of CHD associated with moderate daily drinking. The Academy is concerned, therefore, that any action taken to reduce harm should not be accompanied by loss of benefit. This could happen if a reduction in mean consumption were achieved by a rise in the prevalence of abstainers. However, the evidence this Report has reviewed is reassuring. It suggests that a reduction in mean consumption, for example from 11.1 litres a year (per person aged 15+) to the 1970 level of 7.1 litres, is unlikely to be accompanied by an increase in the prevalence of abstention. This implies that such a reduction would not, in any substantial way, cancel out the protection from CHD derived by those who consume alcohol in moderation becoming abstainers. Neither is there evidence to suggest that any likely level of reduction in population consumption would result in such a fall in the numbers of light drinkers as to have a significantly adverse impact on CHD rates. There is clear evidence in Chapter 2 that Britain is drinking above the levels where loss of benefit would result from reducing national consumption.

4.5 *Health imperatives can be balanced with economic considerations*

This Report concludes that in the interests of public health national alcohol consumption needs to be treated as a policy issue. In the light of the PMSU's estimates on the costs of alcohol misuse (Chapter 1 of this Report), the Academy believes that reduction in those kinds of harm can make a substantial contribution to the Exchequer.

The recommended policy goal

4.6 With the conclusions offered above as context,

the Academy makes the following core recommendation. **As an immediate measure the Academy recommends that the Government's aim should be to prevent any further rise in alcohol consumption and strategies should then aim to bring consumption back to the 1970 level.**

Achieving the goal - need for national deliberation

4.7 The evidence this Report has reviewed suggests that two key mechanisms exist that are likely to lead to reduction of alcohol consumption in the population: price and availability. Putting these mechanisms in place is not straightforward. No matter how honourable its intentions, government action to reduce the burden of alcohol consumption is likely to elicit the cry: 'nanny state'.

4.8 This can be illustrated simply. Take price. A fairly secure prediction can be made that increasing price will lead to a fall in consumption. As with the case for increasing the price of cigarettes on health grounds, the case can be made that taxes on alcohol should be increased to reverse the long-term trend of falling real prices. Similarly, there should be strong resistance to tax harmonisation within the EU that would lead to falling real prices of alcohol in the UK. The argument for taxing alcohol in order to increase the population health is clear. But any government that puts up tax on a popular consumer item risks opprobrium of a high order. The Government will also be concerned that a rise in price will lead to increases in travellers' imports and encourage a thriving black market.

4.9 Similarly with availability. Prolonging the hours during which alcohol can be consumed in licensed premises, and liberalising the number of retail outlets increases consumption. The evidence is strongly suggestive that allowing alcohol to be sold in supermarkets led to an increase in consumption. Calling for a ban on supermarket sale, despite its likely effectiveness, would hardly be a popular move. In the same vein, limiting opening hours of pubs and bars would be reversal of recent policy.

4.10 On health grounds, the Academy would recommend that the statutory legal age for consuming alcohol in pubs, restaurants or other public places, or for purchasing it at retail outlets, should be 18. Given widespread concern about alcohol and public disorder such a proposal might well win popular support.

4.11 The case for stricter drink-driving controls is similarly strong. On health grounds the Academy would recommend lowering the statutory blood alcohol concentration level from 80mg to 50mg%. The Academy would also recommend a zero statutory blood alcohol level as the limit for young drivers up to the age of 21.

4.12 In the Academy's view, faced with a choice between the public health, civil disorder, and personal suffering, on the one hand, and measures that may, by some people, be perceived as unpopular on the other, there is need for a widespread public debate. In a matter as important to so many interests as the population's drinking patterns, policy formation should be left neither to medical scientists nor to politicians alone. Nor should it be abandoned to the market. There should be debate among all the relevant sectors of the population: the public, politicians, and all interested parties. In order to involve the public in this debate, there needs to be widespread education. Public debate can only proceed in full possession of the facts as currently understood. An understanding that there may be a link between the promotion of alcoholic beverages to teenagers, widespread retail availability and drunk and disorderly behaviour in our inner cities is necessary for the debate to be properly informed. Furthermore, an understanding of the links between the rise in alcohol consumption and the rise in alcohol-related medical conditions is a precondition for informed debate; as is insight into the likely efficacy of different policies.

4.13 The Academy's view of the scientific evidence is that the public health requires action to be taken to reduce population consumption. That conclusion inevitably confronts government with hard choices. The research evidence that increased price and limitation on access are likely to be the most effective health policy levers in this area, is compelling. There are softer choices

available such as school-based and adult health education, but these receive little research support. For this reason, the form that action should take should come as a result of informed discussion. Health policy must go with the grain of general social trends. There have clearly been cultural changes in countries such as Italy and France that have led to significant drops in mean alcohol consumption in those populations. An informed debate may well lead to similar changes here.

The need to strengthen the alcohol policy research base

4.14 In many aspects of alcohol research there are high-quality international studies that can contribute to the evidence base for the development of British alcohol policy. However, that material does not obviate the need for study of this country's specific national policy experiences. Every policy initiative is a potentially researchable experience with lessons to be learnt. An interdepartmental alcohol policy research programme should be funded. There is also urgent need for greater investment in biomedical research into the mechanisms of alcohol-induced harm, an area largely ignored by current funding bodies. Research is also needed on changing patterns of drinking, their social determinants and their contribution to increases in social problems, such as violence and other antisocial behaviour, (Home Office, 2000) and health problems, such as liver cirrhosis.

Calling time

4.15 A strategic programme is needed now to curb the Nation's escalating level of drinking in the interests of both individual and public health. The country has reached a point where it is necessary and urgent to call time on runaway alcohol consumption

Appendix 1 - References

Agostinelli, G. and Grube, J. W. (2002)
Alcohol counter-advertising and the media.
A review of recent research.
Alcohol Research and Health, 26, 15-21

Agostinelli, G. and Grube, J. W. (2003)
Tobacco counter-advertising: a review of the literature and a conceptual model for understanding effects.
Journal of Health Communication,
8, 107-127

Alcohol Concern (1999)
Proposals for a national alcohol strategy for England.
Alcohol Concern: London

Alcohol Harm Reduction Group (2003)
No Half-Measures [On-line] AHRG: London.
Available from: http://www.alcoholconcern.org.uk
Accessed: November 2003

Associated Press (2003)
Wine industry urges drinking, driving [On-line]
Associated Press: Paris.
Available from: http://www.msnbc.com
Accessed: November 2003

Babor T. *et al.* (2003)
Alcohol: No Ordinary Commodity.
Research and public policy.
Oxford University Press: Oxford

Bobak, M. *et al.* (in press)
Contribution of drinking patterns to differences in rates of alcohol-related problems between three urban populations.
Journal of Epidemiology and Community Health

Bondy, S. *et al.* (1999)
Low-risk drinking guidelines: the scientific evidence.
Canadian Journal of Public Health, 90, 264-270.

Bonnie, R. J. and O'Connell, M. E. (eds.) (2003)
Reducing Underage Drinking: A Collective Responsibility.
Report of a Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Institute of Medicine. National Academy Press: Washington DC

Borschos, B. (2000)
Evaluation of the Swedish drunken driving legislation implemented on February 1, 1994.
[On-line] Presented at the 15th International Conference on Alcohol, Drugs and Traffic Safety, Stockholm, Sweden: 22-26 September.
Available from: http://www.vv.se
Accessed: January 2004

British Beer and Pub Association (2001)
Statistical Handbook 2001.
British Beer and Pub Association: London

Britton, A. and McPherson, K. (2001)
Mortality in England and Wales attributable to current alcohol consumption.
Journal of Epidemiology and Community Health,
55, 6, 383-388

Bruun, K. *et al.* (1975)
Alcohol control policies in public health perspective.
Finnish Foundation for Alcohol Studies: Helsinki

Casswell, S. and Gilmore, L. (1989)
Evaluated community action project on alcohol.
Journal of Studies on Alcohol, 50, 339-346

Casswell, S. and Zhang, J. F. (1998)
Impact of liking for advertising and brand allegiance on drinking and alcohol-related aggression: a longitudinal study.
Addiction,
93, 1209-1217

Casswell, S., Pledger, M. and Pratap, S. (2002)
Trajectories of drinking from 18 to 26 years: identification and prediction.
Addiction,
97, 1427-1437

Chatterton, P. and Hollands, R. (2003)
Urban Nightscapes: Youth Cultures, Pleasure Spaces and Corporate Power.
Routledge: London

Chief Medical Officer (2001)
On the State of Public Health [On-line] Annual Report, December. Department of Health: London.
Available from: http://www.doh.gov.uk
Accessed: January 2004

Chikritzhs, T. and Stockwell, T. (2002)
Impact of later trading hours for Australian public houses (hotels) on levels of violence.
Journal of Studies on Alcohol,
63, 591-599

Chisholm, D. *et al.* On behalf of WHO-CHOICE (2003)
Reducing the global burden of heavy alcohol use: a comparative cost-effectiveness analysis.
WHO (working paper): Geneva

Colhoun, H. *et al.* (1997)
Ecological analysis of collectivity of alcohol consumption in England: importance of average drinker.
BMJ, 314, 1164-1168

Cook, P. (1981)
The effect of liquor taxes on drinking, cirrhosis, and auto accidents. In: Moore, M. H. and Gerstein, D. R. (eds.)
Alcohol and Public Policy.
National Academy Press: Washington DC. 255-285

Cook, P. J. and Moore, M. J. (1993)
Violence reduction through restrictions on alcohol availability.
Alcohol Health and Research World,
17, 151-156

Cooke, E *et al.* (forthcoming)
Desk research to examine the influence of marketing and advertising by the alcohol industry on young people's alcohol consumption.
Centre for Social Marketing, University of Strathclyde, research prepared for the WHO

Duffy, J. and Cohen, G. (1978)
Total alcohol consumption and excessive drinking.
British Journal of Addiction, 73, 259-264

Edwards, G. *et al.* (1994)
Alcohol policy and the public good.
Oxford University Press: Oxford

English, D. *et al.* (1995)
The quantification of drug caused morbidity and mortality in Australia. Commonwealth Department of Human Services. AGPS: Canberra

Europa (2003)
Shopping within the EU. Tobacco and alcohol
[On-line] European Commission: Brussels.
Available from: http://europa.eu.int
Accessed: February 2004

Foxcroft, D. R. *et al.* (2003)
Longer-term primary prevention for alcohol misuse in young people: A systematic review.
Addiction,
98, 397-411

Goodliffe, J. (2003)
Can the civil law implement alcohol policy?
[On-line] Alcohol Alert: Cambridge.
Available from: http://www.ias.org.uk
Accessed: January 2004

Graham, K., Jelley, J. and Purcell, J. (2003)
Training bar staff in preventing and managing aggression in licensed premises. Presented at the 29th Annual Alcohol Epidemiology Symposium of the Kettil Bruun Society for Social and Epidemiological Research on Alcohol. Kettil Bruun Society: Krakow

Hemström, Ö. (2001)
Per capita alcohol consumption and ischaemic heart disease mortality.
Addiction,
96, supplement 1, 93-112

HM Customs and Excise (2002a)
Measuring Indirect Tax Losses
[On-line] HM Customs and Excise: London.
Available from: http://www.hm-treasury.gov.uk
Accessed: November 2003

HM Customs and Excise (2002b)
Customs launch major clampdown on illegal alcohol in the East Midlands
[On-line] Regional News Release EM/10/02 HM Customs and Excise: London.
Available from: http://www.hmce.gov.uk
Accessed: January 2004

Hobbs, D. *et al*. (2003)
Bouncers: Violence and Governance in the Night-time Economy.
Oxford University Press: Oxford

Home Office (2000)
Report of Policy Action Team 8: Anti-Social Behaviour
[On-line] Home Office: London.
Available from http://www.neighbourhood.gov.uk
Accessed: January 2004

Home Office (2003)
Tackling alcohol related crime, disorder and nuisance
[On-line] Home Office: London.
Available from: http://www.homeoffice.gov.uk
Accessed: January 2004

Huang, C. D. (2003)
Econometric Models of Alcohol Demand in the United Kingdom [On-line] HM Customs and Excise: London.
Available from: http://www.hmce.gov.uk
Accessed: January 2004

The Institute of Alcohol Studies (1999)
National Alcohol Strategy [On-line] Institute of Alcohol Studies: Cambridge.
Available from: http://www.ias.org.uk
Accessed: January 2004

Jernigan, D. (2001)
Global Status Report: Alcohol and Young People.
WHO: Geneva

Larimer, M. E. and Cronce, J. M. (2002)
Identification, prevention and treatment: a review of individual-focused strategies to reduce problematic alcohol consumption by college students.
Journal of Studies on Alcohol Supply, 14, 148-163

Ledermann, S. (1956)
Alcool, Alcoolism, Alcoolisation. Vol I. Presses Universitaires de France: Paris

Leifman, H. (2001)
Estimations of unrecorded alcohol consumption levels and trends in 14 European countries.
Nordic Studies on Alcohol and Drugs,
18, (English supplement), 54-70

Leifman, H., Hemström, Ö. and Ramstedt, M. (2001)
The ECAS-survey on drinking patterns and alcohol-related problems. In: Norström, T. (ed.)
Alcohol in Post-war Europe.
European Commission: Stockholm

Leifman, H. (2002)
Comparative analysis of drinking patterns in six EU countries in the year of 2000.
Contemporary Drug Problems,
29, 501-548

Marmot, M. and Feeney, A. (1999)
Inequality, alcohol and alcohol-associated harm. In: Waller, S., Crosier, A. and McVey, D. (eds)
Inequalities in health.
Health Education Authority: London. 79-85

Leon, D. A. *et al*. (1998)
Huge variation in Russian mortality rates 1984-94: artefact, alcohol, or what?
Lancet, 350, 383-388

Ludbrook, A. *et al*. (2001)
Effective and Cost-Effective Measures to Reduce Alcohol Misuse in Scotland: A Literature Review
[On-line] Health Economics Research Unit, Scottish Executive: Edinburgh.
Available from: http://www.scotland.gov.uk
Accessed: January 2004

Mäkelä, P., Rossow, I. and Tryggvesson, K. (2002)
Who drinks more and less when policies change? The evidence from 50 years of Nordic studies. In: Room, R. (ed.)
The Effects of Nordic Alcohol Policies: What Happens to Drinking and Harm when Alcohol Controls Change?
Nordic Council for Alcohol and Drug Research Publication 42: Helsinki. 17-70

Møller, L. (2002)
Legal restrictions resulted in a reduction of alcohol consumption among young people in Denmark. In: Room, R. (ed.) *The Effects of Nordic Alcohol Policies: What happens to Drinking and Harm when Controls Change?* Nordic Council for Alcohol and Drug Research: Helsinki. 155-166

Murray, R.P. *et al.* (2002)
Alcohol volume, drinking pattern, and cardiovascular disease morbidity and mortality: is there a U-shaped function?
American Journal of Epidemiology, 155, 242-248

Norström, T. (2001)
Per capita alcohol consumption and all-cause mortality in 14 European countries.
Addiction, 96, supplement 1, 113-128

Norström, T. and Skog, O-J. (2001)
Alcohol and mortality: methodological and analytical issues in aggregate analyses.
Addiction, 96, supplement 1, 5-17

Norström, T. *et al.* (2002)
Mortality and population drinking. In: Norstrom, T. (ed.) *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries.*
Almqvist & Wiksell International:
Stockholm. 157-175

Norström, T. (submitted)
Per capita consumption and all-cause mortality in Canada, 1950-1998

Office for National Statistics data.
Available from: http://www.statistics.gov.uk/
Accessed: February 2004

Österberg, E. (1995)
Do alcohol prices affect consumption and related problems. In: Holder, H. D. and Edwards, G. (eds.) *Alcohol and Public Policy: Evidence and Issues.*
Oxford University Press: Oxford

Osborn, A. and Elliott, L. (2002)
Anti-smuggling regime under EU fire
[On-line] Guardian: London.
Available from: http://www.guardian.co.uk
Accessed: January 2004

Pirmohamed, M. *et al.* (2000)
The burden of alcohol misuse on an inner-city general hospital.
Quarterly Journal of Medicine, 93, 291-295

Poynard, T., Bedossa, P. and Opolon, P. (1997)
Natural history of liver fibrosis progression in patients with chronic hepatitis C.
Lancet, 349, 825-832

Prime Minister's Strategy Unit (2003)
Interim Analytical Report
[On-line] Stationary Office: London.
Available from: http://www.pm.gov.uk/output/Page77.asp
Accessed: February 2004

Primatesta, P., Falaschetti, E. and Marmot, M. (2002)
Average alcohol consumption and patterns of drinking. Unpublished

Ragnarsdóttir, T., Kjartansdóttir, A. and Davidsdóttir, S. (2002)
The effect of extended alcohol serving-hours in Reykjavik. In: Room, R. (ed.) *Effects of Nordic Alcohol Policies: What Happens to Drinking and Harm When Alcohol Controls Change?*
Nordic Council for Alcohol and Drug Research (NAD): Helsinki. 145-154

Raistrick, D., Hodgson, R. and Ritson, B. (1999)
Tackling Alcohol Together: The Evidence Base for a UK Alcohol Policy.
Free Association Books: London

Ramstedt, M. (2001a)
Per capita alcohol consumption and liver cirrhosis in 14 European countries.
Addiction, 96, supplement 1, 19-34

Ramstedt, M. (2001b)
Alcohol and suicide in 14 European countries.
Addiction, 96, supplement 1, 59-77

Ramstedt, M. (2003)
Alcohol consumption and liver cirrhosis mortality with and without mention of alcohol - the case of Canada.
Addiction, 98, 1267-1276

Ramstedt, M. (submitted, a)
Pancreatitis mortality - the forgotten indicator of alcohol-related harm? - experience from 14 Western countries.

Ramstedt, M. (submitted, b)
Is alcohol good or bad for Canadian hearts? - a time-series analysis with focus on beverage specific effects on male IHD mortality

Rimm E. B. *et al.* (1996)
Review of moderate alcohol consumption and reduced risk of coronary heart disease: is the effect due to beer, wine, or spirits?
BMJ, 23, 731-736

Room, R. (1975)
Minimizing alcohol problems. In: Chafetz, M. E. (ed.)
Proceedings of the Fourth Annual Alcoholism Conference of the National Institute on Alcohol Abuse and Alcoholism.
USGPO: Washington DC. DHEW Publication No. (ADM) 76-284. 379-393

Rose, G. and Day, S. (1990)
The mean population predicts the number of deviant individuals.
BMJ, 301, 1031-1034

Rossow, I. (2001)
Alcohol and homicide: a cross-cultural comparison of the relationship in 14 European countries.
Addiction, 96, supplement 1, 77-92

Royal College of Physicians Working Party Report (2001)
Alcohol - can the NHS afford it?
Royal College of Physicians: London

Saffer, H. (2002)
Alcohol advertising and youth. *Journal of Studies of Alcohol Supply,* 173-181

Saffer, H. and Dave, D. (2004)
Alcohol Consumption and Alcohol Advertising Bans.
Applied Economics, 34, 1325-1334

Shkolnikov, V. M. and Nemtsov, A. (1997)
The anti-alcohol campaign and variations in Russian mortality. In: Bobadilla, J. L., Costello, C. A. and Mitchell, F. (eds.)
Premature Death in the New Independent States.
National Academy Press: Washington DC. 239-261

Shults, R. *et al.* (2001)
Reviews of evidence regarding interventions to reduce alcohol-impaired driving.
American Journal of Preventive Medicine,
21, supplement 4, 66-88.

Single, E. *et al.* (1999)
Morbidity and mortality attributable to alcohol, tobacco, and illicit drug use in Canada.
American Journal of Public Health, 89, 385-390

Skog, O-J. (1985)
The collectivity of drinking cultures: A theory of the distribution of alcohol consumption.
British Journal of Addiction, 80, 83-99

Skog O-J. (1986)
Trends in alcohol consumption and violent deaths.
British Journal of Addiction, 81, 365-379

Skog, O-J. (1991)
Drinking and the distribution of alcohol consumption.
In: Pittman D. J. and White, H. R. (eds.)
Society, Culture and Drinking Patterns Reexamined.
New Brunswick, Rutgers Center of Alcohol Studies: New Jersey. 135-156

Skog, O.-J. (1996)
Public health consequences of the J-curve hypothesis of alcohol problems.
Addiction, 91, 325-337

Skog, O-J. (2001a)
Alcohol consumption and overall accident mortality in 14 European countries.
Addiction, 96, supplement 1, 39-48

Skog, O-J. (2001b)
Alcohol consumption and mortality rates from traffic accidents, accidental falls, and other accidents in 14 European countries.
Addiction, 96, supplement 1, 49-58

Skog, O-J. (2003)
Alcohol consumption and fatal accidents in Canada, 1950-98.
Addiction, 98, 883-893

Tighe, A. (ed.) (2003)
Statistical Handbook 2003.
Brewing Publications Limited: London

Wagenaar, A. C. and Toomey, T. L. (2002)
Effects of minimum drinking age laws: Review and analyses of the literature from 1960 to 2000.
Journal of Studies on Alcohol, supplement 14, 206-225

Wallin, E., Norström, T. and Andréasson, S. (2003)
Alcohol prevention targeting licensed premises: a study of effects on violence.
Journal of Studies on Alcohol, 64, 270-277

World Advertising Research Centre (2002)
Advertising Statistics Yearbook. World Advertising Research Centre: Henley-Upon-Thames

Worpole, K. (2003)
A problem with drink?
[On-line] Open Democracy: London.
Available from: http://www.opendemocracy.net
Accessed: January 2004

Williams, G. P. and Brake, G. T. (1980)
Drink in Great Britain 1900-1979. Edsall: London

Zhang, J-F. and Casswell, S. (1999)
The effects of real price and a change in the distribution system on alcohol consumption.
Drug and Alcohol Review, 18, 371-378

Zimmerman, R. (in press)
Netherlands alcohol policy
[On-line] The Silvergate Group: San Diego.
Available from: http://www.silvergategroup.com
Accessed: January 2004

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Appendix 3 - Terms of reference and work plan

Terms of Reference

To identify, characterise and document the overall national consumption of alcohol, the evidence that this is a major determinant of harm and the opportunities for effective public health intervention that follow from this.

In order to achieve this goal the Working Group sought to:

- identify areas for detailed policy discussion involving a cross-section of interests;
- raise specific and general issues relating to alcohol harm minimisation strategy;
- be evidence-based;
- address policy-issues across government departments;
- complement the parallel report on alcohol misuse being produced by the Prime Minister's Strategy Unit.

Work plan

The Working Group first met in September 2003 to agree work plans, scope and responsibilities. Working Group members provided evidence, analysed issues and established strategic prioritisation at meetings in November and December of 2003. Working Group meetings were attended by observers from some stakeholder organisations.

A draft report was produced after a further editorial meeting in January 2004 and was approved by the Officers of the Academy that month. The Academy's review procedure was then initiated and the report received approval from the Academy's Council in February 2004.

Appendix 4 - Acronyms and abbreviations

A&E:	Accident and Emergency
BAL:	Blood Alcohol Level
BMJ:	British Medical Journal
CHD:	Coronary Heart Disease
CMO:	Chief Medical Officer
DH:	Department of Health
ECAS:	European Comparative Alcohol Study
ONS:	Office for National Statistics
PMSU:	Prime Minister's Strategy Unit
RBT:	Random Breath Testing
WARC:	World Advertising Research Centre
WHO:	World Health Organisation

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