

Costs to Society of Problem Alcohol Use in Ireland

A Report for the Health Service Executive



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Prepared by: **Sean Byrne B.Comm., M.Econ.Sc.**
Lecturer in Economics
Dublin Institute of Technology

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Summary

Alcohol consumption in Ireland doubled between 1970 and 2003, one of the largest increases in the world during that period. This increase occurred over a period when alcohol consumption was falling in most developed countries. Though consumption has fallen slightly since 2003, Irish consumption at 13.4 litres of pure alcohol per person is the second highest in the OECD.

Ireland also has one of the highest levels of underage drinking in the developed world and one of the worst records for binge drinking. The increase in alcohol consumption has caused a commensurate increase in alcohol related harms in Irish society. These are comprehensively documented in *Alcohol Related Harms in Ireland* (Hope, 2008) which shows an alarming increase in alcohol related accidents and illnesses, alcohol related crime, alcohol related domestic abuse and alcohol related absences from work.

All of these harms impose significant costs on Irish society in addition to the costs borne by the drinkers themselves. The main costs are the additional costs imposed on the health care system, the criminal justice system and the costs of road accidents. Since the 1970s most developed countries have published estimates of the costs of alcohol related harms. A preliminary estimate of €2 billion as the total cost to society of alcohol related harm in Ireland, based on the limited data available at the time, was published in the report of the Strategic Task Force on Alcohol in 2004. Since the publication of that report, more data, particularly on alcohol related illnesses has become available.

The estimates in this report are based on the methods used in similar reports from other developed countries, particularly the reports for England and Wales and for Scotland and Northern Ireland. The estimated overall cost to Irish society of problem alcohol use is €3.7 billion in 2007. The components of the estimates are given in the following table.

	€million	% of total costs
Cost to the health care system of alcohol related illnesses	€1,200	32
Cost of alcohol related suicides	167	5
Cost of alcohol related road accidents	526	14
Cost of alcohol related crime	€1,189	32
Cost of output lost due to alcohol related absence from work	330	9
Cost of alcohol related accidents at work	197	5
Cost of alcohol related premature mortality	110	3
Total	€3,719	100

The total cost of €3.7 billion represented 1.9% of GDP in Ireland in 2007. Baumberg and Anderson (2006) in their review of studies of the social cost of alcohol misuse in the EU calculated the average total *tangible* social cost of alcohol misuse to be 1.3% of GDP in the EU with a range of 0.9% to 2.4%.

The studies for England and Wales and for Scotland estimate the social costs of alcohol misuse figures as 1.7% of GDP for England and Wales in 2001 and 1.5% for Scotland in 2003. The Northern Ireland study estimates the social cost of alcohol misuse in Northern Ireland in 2008 to be 1.8% of GDP.

The estimates in this paper are for the *tangible* costs of problem alcohol use and are an underestimate insofar as sufficient data is not available in Ireland to calculate some of the tangible costs included in estimates from other countries. No attempt is made in this paper to calculate the human or emotional costs of problem alcohol use. In the UK study, the estimate of the emotional cost of alcohol related crime is three times the tangible cost to the criminal justice system of such crime. While estimates of the tangible costs of problem alcohol use will always be subject to reservations, when the unquantified human costs are considered, estimates of the tangible costs greatly understate the true cost of problem alcohol use to society.

This study concludes with an examination of the impact of alcohol price on consumption and on alcohol related harms. There is strong evidence from many countries that increasing the price of alcohol reduces alcohol consumption and related harms. While the nominal price of alcohol has risen significantly over the past 15 years, the *real* price which is the price adjusted for changes in income, has fallen by 50 per cent since the mid 1990s because incomes have risen faster than money alcohol prices and excise duties have declined in real terms.

Ireland imposes relatively high nominal excise duty rates on alcohol but the real value of these duties have fallen steeply since 1996. There have been only three increases in excise duty on alcohol since 1994 and the duty on beer has remained unchanged since 1994. The duty on spirits was raised in 2003 but was lowered in the 2010 Budget. The decline in the real price of alcohol in Ireland has resulted in alcohol becoming significantly more affordable, particularly for young people, which in turn has led to the very alarming increase in consumption from 1990 to the present. There is considerable evidence that increasing the price of alcohol reduces alcohol related harms and the government should seriously consider raising the rate of excise duty on alcohol as a means of reducing harms.

1. Measuring the economic costs of problem alcohol use- concepts and problems

1.1 External cost of alcohol consumption

Economists have long recognised that the consumption of some goods that give benefits to consumers may impose costs on others that are not borne by the consumer or producer. External costs in consumption are particularly high in the case of alcohol and cigarettes. While moderate consumption of alcohol does not impose social cost if the drinker does not drive, excessive drinking imposes very obvious costs to society, principally in the form of increased expenditure on health care, the cost of alcohol related crime and the loss of output resulting from alcohol related absences from work.

These costs are borne by society as a whole and can be estimated, albeit with a margin of error. The equally disturbing external costs that are only partially reflected in the figures for the cost to society are the external costs imposed on the families and friends of those who misuse alcohol. The children of alcohol abusing parents are likely to suffer poor physical and mental health. The babies of women who drink during pregnancy may suffer foetal alcohol syndrome which in extreme cases can result in growth deficiency and mental disability. The children of parents who drink to excess are more susceptible than other children to mental illness, substance abuse, injuries and poisoning (Woodside et al, 1993). They are also more likely to have poor school performance, to engage in anti-social behaviour and have problems forming relationships (Vellman, 1993). The children of alcohol abusers may suffer life long ill effects as a result of their parents drinking.

Figures from the marriage counselling agency, Accord, show that alcohol abuse is involved in 21% of marriage breakdowns (Family Support Agency, 2006). Alcohol is a factor in up to 70% of cases of domestic violence against women (National Crime Council of Ireland, 2006) but as only about 5% of domestic violence cases end in a conviction most of the cost of domestic violence does not enter the cost of crime figures.

1.2 Why measure the costs of problem alcohol use?

As the external costs of problem alcohol use are very significant there are large potential savings to individuals, families, businesses and the public sector if problem alcohol use can be reduced. Estimates of the cost of problem alcohol use are also useful in justifying and formulating appropriate and effective policies for prevention, treatment and enforcement strategies in relation to alcohol misuse.

Cost benefit analysis is a useful tool in evaluating government policies and estimates of the cost of problem alcohol use can assist policy makers in evaluating policies aimed at reducing the harm caused by problem alcohol use.

Cost estimates are also useful in designing taxation policies for alcohol and setting targets for reducing the health costs imposed by alcohol use and for reducing alcohol related crime and disorder.

Estimating the cost of problem alcohol use can help to identify research needs and gaps in national statistical reporting systems. Cross national comparisons of cost estimates are also useful in comparing the consequences of problem alcohol use in different countries and the different policy approaches used in dealing with these consequences.

1.3 The principal external costs of problem alcohol use

In estimating the cost to society of problem alcohol use, the complexity of the link between such problem use and the social costs to which it gives rise must be acknowledged. Establishing cause and effect relations is not easy. The link between alcohol and suicide is a case in point. As in other countries, in Ireland there is a positive association between per capita alcohol consumption and suicide rates. People contemplating suicide, particularly young men, may drink to give them courage to attempt suicide but depressed people may drink heavily as a form of self medication not being aware that alcohol is a depressant that may deepen their depression to the point of making them suicidal.

This paper attempts to calculate the costs imposed on society by problem alcohol use which is amenable to quantification, however imperfectly. A large proportion of the costs caused by excessive drinking is borne by the families of heavy drinkers in the form of emotional distress and cannot be easily quantified.

The main costs imposed on society by those who abuse alcohol are;

- (i) the costs to the health care system of dealing with alcohol related illnesses and accidents;
- (ii) the cost of premature deaths which are a direct or indirect result of alcohol;
- (iii) the reduction in output because of working days lost or reduced productivity due to alcohol misuse;
- (iv) the cost of alcohol related crime;
- (v) the cost of alcohol related road accidents;
- (vi) the cost of alcohol related suicides.

In estimating costs it is important to recognise that the pattern of drinking is as important as the overall level of consumption in imposing costs on society. Drinkers who are dependent on alcohol usually thought of as

“alcoholics”, do not impose the largest share of costs on society. Although alcoholics are likely to suffer from a range of illnesses which are classified as alcohol related in the International Classification of Diseases such as alcoholic psychosis, alcoholic liver cirrhosis and alcoholic cardiomyopathy, the cost burden imposed by this relatively small number of abusers is not the largest part of the costs of alcohol misuse to society. While dependent drinkers are likely to have the largest number of health, social and other problems they account for a relatively small share of the total cost of problem alcohol use to society.

The phenomenon of binge drinking where a significant proportion of drinkers drink very heavily on their drinking occasions leads to more accidents, injuries and crime than the Southern European pattern where small quantities of alcohol are consumed on most days. Social attitudes are also important. In Ireland and the UK there is a greater tolerance of public drunkenness than in France which results in more social costs in terms of crime and A&E admissions while in France heavy consumption of alcohol in the home leads to higher level of liver cirrhosis.

1.4 Structure of this paper

Section two of this paper examines the trend in alcohol consumption over the past decade and shows how the pattern of consumption as well as the overall level of consumption creates external costs. Section three discusses the problems of defining and identifying the main costs of problem alcohol use in Ireland. This section also briefly reviews previous research in this field, looking mainly at UK and Irish research. Section four attempts to estimate the health care costs of problem alcohol use.

Section five estimates the costs of alcohol related road accidents and section six attempts to estimate the cost of alcohol related crime. Section seven estimates the cost of alcohol related absenteeism from work. Section eight considers the human cost of alcohol misuse. Section nine summarises the overall cost of problem alcohol use to society. Section ten examines the impact of the pricing and taxation of alcohol on alcohol consumption.

2. Trends in alcohol consumption in Ireland

2.1 Overall consumption.

The pattern of alcohol consumption in Ireland over the past twenty years is comprehensively analysed by Hope in *Alcohol Consumption in Ireland 1986-2006* (Health Services Executive, 2008). Hope's study shows that alcohol consumption per adult increased from 9.8 litres of pure alcohol in 1987 to 13.4 litres in 2006. Consumption per adult had risen to a high of 14.3 litres in 2001. There was a slight decrease in consumption per adult between 2004 and 2006 due to a greater increase in the adult population than in alcohol sales.

Despite the slight decline in consumption per adult from 2004 to 2006 Irish drinkers remain among the highest consumers of alcohol in Europe, ranking third after Luxembourg and Hungary on consumption per adult.

It should be noted that Ireland has a relatively high proportion of abstainers from alcohol. Ramstedt and Hope's 2005 study of drinking habits in seven EU countries (Ireland, Finland, Sweden, Germany, UK, France and Italy) participating in the European Comparative Alcohol Study (ECAS) showed that at 23%, Ireland had by far the highest proportion of abstainers. This leads to the conclusion that *consumption per drinker* in Ireland is considerably higher than consumption per adult.

A March 2007 Eurobarometer special report *Attitudes towards alcohol* (EU, 2007) found that 70% of Irish adults drink compared to 66% of all EU adults. The survey showed that Irish people drink on fewer occasions but drink more heavily on those occasions. Only 2% of Irish people drink daily compared to 13% of Europeans but only 10% of Europeans consume five or more drinks at one sitting compared to 34% of Irish drinkers who drink at least five drinks in one sitting. The Eurobarometer survey found that 54% of Irish drinkers had drunk five or more drinks on one occasion in the previous year. This was the highest recorded of the 29 countries surveyed with the average being 28%.

In terms of type of alcohol consumed, there has been a decline in the share of beer and spirits in total consumption and an increase in the share of wine and cider (Hope, 2008).

2.2 Drinking patterns and social costs

The patterns of drinking in terms of frequency of consumption and amount of alcohol consumed per occasion are important factors in determining the resulting alcohol related harm. Drinking to intoxication, binge drinking and regular heavy drinking impose the greatest costs on society and in Ireland all of these types of drinking are common. The WHO defines binge drinking as the consumption of six or more standard drinks on a

single drinking occasion. (A standard drink is a half pint of beer, a single measure of spirits or one small glass of wine).

Ramstedt and Hope in their 2005 study showed that Irish adults had the highest reported consumption per drinker and the highest level of binge drinking of the 7 ECAS countries. For Irish men, binge drinking was the norm with 58 out of 100 drinking occasions resulting in binge drinking while for women the proportion was 30 per cent. The same survey found that 30% of men and 22% of women consume more than the recommended upper limits of 21 standard drinks for men and 14 for women.

Irish children and teenagers are also more likely to be regular and heavy drinkers than children and teenagers in other European countries. In 2002, 16% of boys and 12% of girls aged 12-14 were current drinkers while roughly half of 15-17 year old boys and girls were regular drinkers with 60% of boys and 56% of girls reporting being regularly drunk (Ramstedt and Hope, 2005).

2.3 Adverse consequences of Ireland's drinking pattern

The extent of alcohol related harm in Ireland is comprehensively documented in Alcohol Related Harm in Ireland (Hope, 2008). Hope's study analyses the burden of alcohol harm from illness and accidents, drink driving, unsafe sex, alcohol related crime and violence and the impact of alcohol in the workplace. The study shows a sharp increase in all of these harms over the past twenty years with most of the increase occurring since the mid 1990s.

Ireland's pattern of binge drinking, which is similar to that in the UK, leads to greater social costs than in countries such as France and Germany where consumption per adult is relatively high but where binge drinking is less common.

The adverse consequences of Ireland's pattern of drinking are shown in the ECAS study where Irish men had the highest levels of recorded drink related harms of the 7 countries studied (Ramstedt and Hope, 2005). Fights, accidents and adverse effects on work are costs largely borne by society as a whole while adverse effects on health are borne both by the individual and society.

The adverse consequences of the drinking pattern of Irish men (and the pattern is similar for Irish women) are more likely to impose costs on society than in other countries with similar overall levels of consumption. The Ramstedt and Hope study also found that 27% of men and 17% of women, whose drinking did not exceed the low risk weekly limits, experienced at least one harm. This shows that a significant proportion of those whose

consumption did not exceed the low risk limits drank all of the alcohol in one or two weekly binges rather than over the week.

Another aspect of Irish alcohol consumption is the fact that most of it takes place in pubs, clubs and public places rather than in the home or in restaurants, and most alcohol is not drunk with food as is often the case in France and Southern Europe. Excessive drinking in pubs, clubs and public places is more likely to result in social costs such as violence and accidents than drinking at home or in restaurants with food.

3. Defining and identifying private and social costs of problem alcohol use

3.1 Definition of Costs

The consumption of many goods that give the consumer benefits involves costs for both the consumer and others. Eating to excess creates private costs in the form of increased risk of illness but drinking to excess has very significant negative effects for third parties which economists term “externalities”. The social cost of drinking to excess is the sum of the private costs and the externalities.

The private costs of problem alcohol use such as payment for medical treatment or higher health insurance premiums are borne by the individual drinker while the external costs such as cost of injury from alcohol related road accidents or crimes are borne by third parties. Significant external costs are also borne by the taxpayer in the form of excess health expenditure and the cost of dealing with alcohol related crime to the criminal justice system. Those who drink to excess, however, contribute significantly to tax revenues through the large amounts of revenue raised from taxes on alcohol and could be said to partly pay for the externalities that they impose on society.

3.2 Private and social benefits of alcohol consumption

While the primary benefit of alcohol consumption is the pleasure, or what economists call utility, that it gives to the consumer, alcohol may also generate some benefits or positive externalities to society as a whole. Alcohol is sometimes referred to as a “social lubricant” that brings people together and enhances their capacity to relax and socialise.

This aspect of alcohol consumption varies from one society to another and is clearly more significant in societies with strong “pub cultures” such as Ireland and the UK than in societies where socialisation centres on eating as in Southern Europe. Alcohol consumption in pubs has decreased in Ireland over the past five years and 52 % of alcohol sales are now for home consumption. The decline in pub sales as a proportion of total

sales may be due to increased alcohol prices, reduced blood alcohol limits for drivers and the banning of smoking in pubs. Reduced alcohol consumption in pubs reduces the social benefits of overall alcohol consumption but may also reduce social harms from drink driving, crime and violence.

The drinks industry frequently draws attention to the value of the output, income and employment it generates and argues that these must be regarded as benefits to society. This argument is based on the assumptions that in the absence of alcohol consumption the money spent on alcohol would not be spent on other goods and services and that the resources used in producing alcoholic drinks have no alternative uses.

In a well functioning market economy, if there were a reduction in alcohol consumption that reduced output and employment in the drinks industry, the resources released should be allocated for the production of other goods. It is true that there might be considerable short run adjustment costs if the drinks industry contracted rapidly as workers with skills specific to the industry were made unemployed and capital equipment in the drinks industry might not have alternative uses. As the alcohol industry had become much less labour intensive over the past twenty years, a decline in output would not greatly increase unemployment.

The output, income and employment effects of the alcohol industry cannot be considered to be a measure of the social benefits of alcohol consumption. In Ireland, the alcohol industry has until recently represented a disproportional share of output and employment and has therefore exercised undue influence on government policy.

3.3 Taxes on alcohol as a source of revenue

Because alcohol is a luxury with significant negative externalities, governments have for centuries raised significant amounts of tax revenue from taxes on alcoholic drinks. Alcoholic drinks are subjected to VAT and also to excise duty. Ireland has the highest rates of excise duty in the EU on beer and wine and the second highest rates on spirits. The Irish excise rate on beer is more than double the EU average and the rate on wine is over three times the EU average. Despite these relatively high rates, revenue from excise duty on alcohol has declined from 7.3% of total tax revenue in 1985 to 2.4% in 2008 (Annual Reports of Revenue Commissioners). This decline is due to the fact that excise duty rates on alcohol have not kept pace with inflation and tax revenues from other sources have increased greatly.

Problem alcohol use results in increased expenditure on health care and law enforcement. It also results in increased spending on social welfare benefits for those unable to work because of problem alcohol use and their dependants. While social welfare payments are transfer payments in that they are funded from taxation

levied on income and expenditure, they represent avoidable expenditure and, in their absence, taxation would be lower. It could be argued that the taxes raised from the sale of alcohol are required to pay for the costs imposed on the exchequer by problem alcohol use, but even if the impact of alcohol consumption on the government's budget was positive, the costs of loss of life, pain and suffering from problem alcohol use would remain.

3.4 Studies of the social cost of problem alcohol use

Beginning in the 1970s many governments in developed countries began to recognise the costs to society of problem alcohol use and commissioned studies of these costs. These studies are too numerous to summarise here but the studies for the UK and Scotland merit particular attention as the pattern of drinking and alcohol related problems in the UK are similar to those in Ireland.

The WHO in its Global Burden of Alcohol report of 2004 includes estimates of the social cost of alcohol for a number of developed countries. The studies from which the estimates are derived vary widely in terms of methodology and reliability of data. In their report to the EU Commission; *Alcohol in Europe: A Public Health Perspective* (Institute of Alcohol Studies, 2006), Baumberg and Anderson reviewed 21 European studies of the social costs of alcohol. Summarising the conclusions of these studies, Baumberg and Anderson arrived at a total tangible cost of alcohol to the European Union of 1.3% of GDP with a range of 0.9% to 2.4% for individual countries.

The costs included in Baumberg and Anderson's report are: costs to the health care system, the cost of alcohol related crime, the cost of alcohol related traffic accidents, the cost of alcohol induced unemployment and absenteeism and the cost of alcohol related premature mortality.

Baumberg and Anderson distinguish between *tangible* costs such as costs to the health care system and to the criminal justice system and of lost output and productivity and *intangible* costs which includes the value people place on pain, suffering and lost healthy life due to alcohol. The intangible costs which Baumberg and Anderson include are psychosocial and behavioural effects of alcohol, the suffering of victims of alcohol related crime and the loss of healthy life due to alcohol related road accidents. Baumberg and Anderson conclude that these intangible costs are almost twice the tangible costs but are subject to a wide margin of error because of the difficulty of putting an economic value on pain, suffering and loss of life.

The two most recent studies for the UK are The UK Cabinet Office report *Alcohol misuse – How much does it cost?* (September, 2003) and the Scottish Executive's *Alcohol Misuse in Scotland; Trends and Costs* (October,

2001). These studies attempt to comprehensively assess the costs to society in England and Wales and in Scotland. Both studies estimate health costs, costs of alcohol related crime and accidents and costs of lost output due to alcohol. The Scottish study also estimates the human costs of problem alcohol use to those whose lives are affected by it other than the drinker. (The cost estimates for both countries have been updated by the increases in prices in both countries for subsequent years).

The Department of Health, Social Services and Public Safety in Northern Ireland published estimates of the cost of problem alcohol use in Northern Ireland in 1999 and a more comprehensive study in 2010 (Department of Health, Social Services and Public Safety, 2010) The Northern Ireland study uses a similar methodology to the study for Scotland.

3.5 Previous Studies of the cost of alcohol problems in Ireland.

The first attempt to quantify the costs of problem alcohol use in Ireland was undertaken by Walsh in a broader study of alcohol in Ireland (Walsh, 1980). Walsh attempted to estimate the cost to the state of dealing with alcohol problems and compared it to the revenue raised from taxes on alcohol. This comparison is a useful input to government policy as taxation of alcohol is one of the factors that influences consumption.

Walsh in his study estimated the following elements of the costs of alcohol problems:

- (1) Road accidents;
- (2) Direct health care costs;
- (3) Cost of social services;
- (4) Lower production due to alcohol related absences from work.

Walsh classified these as real resource costs and to these he added:

- (5) The value of transfer payments which are paid to those suffering the consequences of alcohol abuse including unemployment benefits, disability pay and pensions and
- (6) the loss of income and indirect taxes due to alcohol related illnesses and absences from work.

Of these six sets of costs the largest element was the unemployment benefits, disability benefits, pensions etc and the second largest was the lower production due to alcohol related absences. It could be argued that the transfer payments element should not be included because transfer payments are a redistribution of existing output rather than a measure of output foregone. This argument is valid if the cost to society as a whole is being considered but if the cost to the Exchequer is being estimated this cost is relevant. Exchequer spending

on transfer payments to people suffering the consequences of alcohol abuse could clearly be spent on other areas of government provision.

Of the figures above, items 2, 3, 5 and 6 are borne by the state or taxpayer. Walsh pointed out that the losses due to road accidents were borne by the public at large, mainly as higher insurance premiums, but also more directly (and more unjustly) in uncompensated damage. In Walsh's view the lost output due to alcohol related absences from work was the most problematic figure. He argued that only the loss of tax revenue and the increased unemployment benefits payable due to this factor should be included among the costs of problem alcohol use to the state.

Walsh was unable to estimate most of the different categories of cost directly, as data were not available. He therefore had to make a number of assumptions regarding for example, the proportions of expenditure on health care which could be attributed to alcohol related diseases or disabilities and the proportion of lost output due to problem alcohol use.

Walsh's total cost figure was considerably less than the tax revenue raised from alcohol in 1980 but, as Walsh argues, many of the costs of problem alcohol use, such as the pain and suffering imposed by alcoholics on themselves and others are practically impossible to estimate. These are precisely the costs "that motivate public opinion to endorse strict alcohol control policies" (Walsh, 1980).

Conniffe and McCoy (1993) in their study reviewed Walsh's figures and updated them for inflation. They faced the same data constraints as Walsh had faced and they used his assumptions about proportions of health expenditure, transfer payments attributable to alcohol etc. They found no reason to revise his conclusion that the costs of problem alcohol use to the state were about 50% of the value of the tax revenue raised from taxes on alcohol at the time of their study.

3.6 Strategic Task Force on Alcohol cost estimates

The author of this paper prepared estimates of the cost of alcohol to Irish society for the Second Report of the Strategic Task Force on Alcohol (STFA, 2004). The estimates used the methodology of the studies by Walsh (1980) and Conniffe and McCoy (1993). These estimates suggested that the total cost of problem alcohol use to Irish society was €2.6 billion or 2.6% of GNP. In a paper written for the Drinks Industry Group, Foley (2006) argues that €2.6 billion is an overestimate. Foley considers that output lost due to alcohol related absences is overestimated and that the alcohol related transfer payments should not be included as they do represent a real cost. While due to lack of data, assumptions had to be made about several costs, the overall figure as a

percentage of GNP is within the range of cost figures for other developed countries. In this paper alcohol related transfer payments are not included in order to make the estimates consistent with studies for other countries.

4. Health costs

4.1 Health consequences of problem alcohol use

Prolonged excess consumption of alcohol leads to a number of serious illnesses. The International Classification of Diseases lists nine conditions that are 100% attributable to alcohol of which alcohol dependence, alcoholic psychosis, ethanol toxicity and alcoholic liver cirrhosis are the most common. A further thirty conditions are partly attributable to problem alcohol use. The acute diseases that result from alcohol addiction such as liver cirrhosis affect relatively small numbers of drinkers but a much larger number of drinkers are affected by the illnesses partly attributable to problem alcohol use.

The WHO's Global Burden of Disease study (WHO, 2005) shows alcohol to be the third most significant risk factor for ill health and premature death in Europe after tobacco and high blood pressure. The report shows that between 1992 and 2002 14,223 people in Ireland died from five of the main alcohol related causes of mortality, namely, suicide, cancers, alcohol poisoning, liver cirrhosis and alcohol abuse. The Burden of Disease figures exclude road accident deaths and drowning caused by alcohol consumption. The data on the burden of alcohol related illness in Ireland is comprehensively analysed by Hope (2008).

Data on hospital discharges for alcohol related illnesses and alcohol related mortality compiled by the Health Research Board (2008) using Hospital Inpatient Enquiry figures show a sharp increase in both illness and mortality between 1995 and 2004. Between 1995 and 2004 there was an 88% increase in total alcohol related hospital related discharges while there was a 75% increase for men and a 91% increase for women. The data on alcohol related mortality show an increase in total mortality between 1995 and 2004 of 120% while the increase for men is 157% and for women it is 166%.

The data collected by the Health Research Board above cover only illness or deaths for which an alcohol related condition is given as a primary or secondary diagnosis or as a cause of death. Excess alcohol consumption is a contributory factor to such major causes of death as heart disease, stroke and several cancers but is rarely recorded as a contributory cause of death unless there is an actual diagnosis of an alcohol related disease in conjunction with the main cause of death. Studies cited in Hope (2008) show that in many cases the alcohol consumption of hospital patients is not adequately recorded or not recorded at all so

that the contribution of alcohol to the burden of disease in Ireland is understated. Hospital based surveys in the UK show that up to one third of men admitted to medical and surgical wards have alcohol related problems.

4.2 Accident and emergency costs

A number of studies of admissions to Accident and Emergency departments of Irish hospitals cited in Hope (2008) show that up to 30% of such admissions are alcohol related. Calculating only the cost of the diseases and deaths directly related to alcohol would be a serious underestimate, as many illnesses and accidents are indirectly related to alcohol misuse. Because of the large number of illnesses which are partly attributable to alcohol, it is difficult to ascertain what proportion of total hospital admissions are partly alcohol related. The number of hospital patients to whose illness alcohol is a contributory factor greatly exceeds those who are suffering from conditions caused solely by alcohol misuse such as alcoholic liver cirrhosis.

A UK study shows that up to 40% of men admitted to accident and emergency units are there due to problem alcohol use (Conigrave et al, 1991). Hearne et al (2002) in a survey of patients in a large Dublin hospital found that of the patients they interviewed 30% of the men and 8% of the women met the criteria for alcohol use or dependence. The admitting medical team had recognized an alcohol problem in only 18% of the patients surveyed.

4.3 Alcohol and mental illness

Problem alcohol use is a major cause of admission to psychiatric units representing 16% of all admissions making it the fourth most common cause of admission (Daly et al, 2005). The percentage of inpatients in psychiatric units and hospitals suffering from alcohol disorders doubled between 1971 and 2006. (Daly and Walsh, 2006) Alcohol dependence is now mainly treated in the community and represents a considerable burden on community psychiatric services. Comprehensive data on the number of people requiring outpatient psychiatric services is not available but the Health Research Board is attempting to establish the numbers involved.

A study of substance misuse in the HSE's South Eastern and Southern Areas looked at demand for both outpatient and inpatient services for treatment for drugs and alcohol in the South East region between 2000 and 2004 (HRB, 2004). The study found that alcohol followed by cannabis were the most common main problem substances for which help was sought. Of patients admitted to acute hospitals in the region one fifth had a diagnosis of alcohol dependence. In 2003, the National Psychiatric Inpatient Reporting System reported that there were 541 admissions with an alcohol disorder compared to only 116 for a drug disorder to a psychiatric

unit in the study area. The study also found that of cases referred to the probation and welfare service in the South East for drug or alcohol related offences during 2004, the majority (56%) were for an alcohol related offence.

4.4 Alcohol and suicide

Studies have shown a positive association between per capita alcohol consumption and population suicide rates in several countries (O Farrell, 2004). Brady (2006) finds that there is evidence to suggest problem alcohol use predisposes to suicidal behaviour through its depressive effects and promotion of adverse life events. Brady also finds that acute alcohol use can also precipitate suicidal behaviours through induction of negative affect and impairment of problem-solving skills, as well as aggravation of impulsive personality traits.

In Ireland the suicide rate has almost doubled between 1986 and 2006 which was the most dramatic increase for countries for which reliable data are available. (It is important to note that suicide was underreported in the past so part of the increase may be due to more accurate reporting). This increase took place over a period when alcohol consumption also increased dramatically. The impulsive nature of some of these suicides by young men is facilitated by alcohol consumption (O Farrell, 2004). McGovern and Cusack (2006) find that alcohol is a factor in a high proportion of single vehicle crashes, many of which are suicidal in nature.

A study by the Departments of Public Health in the former health boards (2001) based on a survey of GPs and psychiatrists found that 21% of GP patients who attempted or committed suicide had taken alcohol immediately preceding the suicide event. Twenty one per cent of GP patients and 27% of psychiatrists' patients who had attempted or committed suicide had a history of alcohol abuse.

Bedford et al (2006a) studied all cases in 2001 and 2002 where a person died as a result of injury or suicide. Ninety per cent of the suicides were male and of these 56% had alcohol in their blood. Men aged less than 30 were significantly more likely to have alcohol in their blood and over half of those aged less than 30 had blood alcohol concentration in excess of 160 mg/100ml which are amongst the highest in the international literature. Walsh (2010) also finds a strong link between alcohol and suicide, particularly among young men.

In his paper *The Economic Cost of Suicide in Ireland* Kennelly (2003) estimated that the cost of suicide in Ireland in 2003 was €835 million. Kennelly's estimates include the direct cost of suicide such as medical and emergency service costs but these are very small compared to the indirect cost. The huge indirect cost is based on the "willingness to pay" approach to valuing human life. This involves calculating what people would

be willing to pay to avoid some event such as illness or pain and suffering. In this case it is an estimate of the value of life of the person who commits suicide. Assuming 20% of suicides were alcohol related gives a cost of €167 million for alcohol related suicides.

4.5 Estimate of total health care costs of problem alcohol use.

The UK Cabinet Office study (2003) and the Study by Catalyst Consultants (2006) for the Scottish Authority give costs to the respective health care systems of problem alcohol use based on information on the usage of various health services by those suffering from the effects of alcohol misuse. In Ireland the recording of alcohol related conditions is not sufficiently detailed to allow costs to be estimated directly for the services listed above. There is also the problem of distinguishing between illnesses which are directly attributable to alcohol such as alcoholic liver cirrhosis and the much larger number of illnesses such as heart disease and stroke to which problem alcohol use contributes. Costing only those illnesses directly attributable to alcohol would be a considerable underestimate of the total costs of problem alcohol use to the health care system.

In the absence of detailed figures for the cost burden on the various elements of the health service imposed by problem alcohol use only estimates based on assumed percentages can be made. In the case of hospital services the Health Research Board (2008) using figures from HIPE has estimated that 3% of all hospital bed days are attributable to alcohol related illnesses. These cover illnesses where alcohol is mentioned as either a primary or a secondary diagnosis.

The 3% calculated by the Health Research Board refers only to illnesses where alcohol is directly connected to the diagnosis. Excess consumption of alcohol contributes significantly to the risk of developing other illnesses, particularly heart diseases and cancer. In her paper on alcohol attributable deaths and hospitalisations Martin (2009) calculates the proportion of death and hospitalisations for illness such as cancer and cardiovascular disease attributable to problem alcohol use. She concludes that 10.3% of all hospitalisations over the period 2000 to 2004 could be attributed to problem alcohol use. It is reasonable therefore to attribute 10% of the cost of hospital care to alcohol related illnesses. For 2007 this amounts to €500 million.

Problem alcohol use imposes a considerable burden on GP, outpatient and community care services but as this is not fully documented it is not possible to cost it directly. In Northern Ireland where the pattern of drinking and of alcohol related harm is similar to that in Ireland it is estimated that 7% of GP patients have or are likely to develop health problems because of their heavy drinking (*Northern Ireland Department of Health, 1999*). Patients suffering from alcohol related problems tend to consult their GP twice as often as the average patient.

This would suggest that alcohol related illnesses may account for more than 7% of the total cost of the GP service. However, it is reasonable to assume that at least 7% of the cost of the GP and related services in Ireland are accounted for by alcohol related illnesses. Seven per cent of total public spending on the GP services and community care in 2007 was €574 million.

Alcohol is the third most common cause of admission to mental hospitals with 14% of admissions being for alcohol related illnesses (Daly and Walsh, 2006). Accurate figures are not available for the burden of alcohol on community psychiatric services but the Health Research Board's study of the numbers availing of drug treatment services in the South and South East (HRB, 2004) shows that up to 50% of those seeking treatment sought it for alcohol related problems. This suggests that the burden on community psychiatric services is considerable, as most alcohol related mental illness is now treated in the community.

The Health Research Board's census of psychiatric inpatients shows that most of those admitted for alcohol related problems stay in hospital for only short periods and therefore do not incur as high a cost as other mental illnesses such as depression and schizophrenia where patients are hospitalised for longer periods. It is likely, however, that the proportion of the cost of government spending on mental illness that can be attributed to problem alcohol use is at least as great, if not greater, than the 10% of cost of general hospital in-patient days that can be attributed to problem alcohol use. For 2007, 10% of the cost of Mental Health Services amounts to €104 million.

The total estimated cost of the burden imposed by alcohol misuse on the public health care system is €1.2 billion being the total of €500m on hospital inpatient care, €574m on GP and allied services and €104m on mental health services.

5. Cost of alcohol related road accidents

5.1 Road accidents and alcohol

The most comprehensive study of the role of alcohol in road accidents in Ireland is the analysis by Bedford et al (2006) of all road accidents involving a fatality in 2003. This study found that 36 per cent of fatal crashes were alcohol related and in 24 per cent of all crashes the driver was above the legal limit. Of the 21% of crashes which were single driver vehicle single occupant crashes, 62% of the drivers had blood alcohol contents above the legal limit. The study acknowledged that the fact that a crash was alcohol related did not mean that other factors such as speeding were not involved.

5.2 Estimates of road accident costs

Bedford et al (2006) estimated that alcohol was a factor in 36.5% of all fatal road crashes in Ireland in 2003. Alcohol is undoubtedly a contributory factor in many non fatal crashes but the recording of alcohol is not mandatory in the Garda PULSE system so it is difficult to estimate the number of non fatal road accidents that can be attributed to alcohol.

Alcohol related road accidents result in the loss of life, pain and suffering, medical costs and lost output. Other relevant costs include damage to property, insurance administration and police and court costs.

The largest element of the costs is the cost of the loss of life and of pain and suffering. Early estimates of accident costs measured the cost of lost life or injury in terms of output lost when a person was killed or seriously injured. This approach took no account of the pain and suffering caused by accidents. A better methodology based on “willingness to pay” was developed which put a statistical value on a life by considering how much people were willing to pay for reduced risk of death.

This method has been used in the UK since the 1980s in estimating the cost of road accidents. The willingness to pay method covers loss of life, pain and suffering and medical cost as well as lost output. As people vary considerably in how much they are willing to pay to avoid these costs, the statistical value of a life in the UK in 1997 was estimated as lying between £750,000 and £1,250,000. Subtracting medical costs and cost of lost output from a figure within this range gives an estimate of the human costs of an accident.

DKM Consultants (1994) in a study for the Department of Transport first used the willingness to pay method to estimate the cost of road accidents in Ireland. DKM state that their estimates are loosely based on the UK approach but did not explain fully how they translated UK values to Irish values. The National Roads Authority (2004) uses the DKM estimates as a basis for calculating the cost of road accidents in its guidelines for cost benefit analysis of roads projects.

Bacon and Associates (2004) in their assessment of government strategy for road safety relied largely on the UK methodology but used lower values for lost output, arguing net rather than gross output should be included. This effectively gives a lower value of a statistical life in Ireland than in the UK which is inconsistent with other parts of the report which argue that the UK values may be too low.

The DKM figure for the value of a fatality updated to 2007 would be €1.7m while the updated Bacon figure would be €1.2 million. Goodbody Consultants (2004) in their report for the Department of Transport using the

UK values as a starting point revised and updated the UK estimates and arrived at a value of €2.2m for a fatality in 2002. They estimated the cost of serious injury as €304,000, a slight injury as €30,000 and an accident involving only material damage as €2,400.

The National Roads Authority (2005) in its *Road Collision Facts* uses the Goodbody calculations to estimate the total cost of road collisions in 2003 as €1.44bn. The Bedford et al study (2006) found that in 36.5% of fatal collisions alcohol was a factor. Fatal collisions are only a small proportion of all collisions and while the cost of such collisions is very high because of the high value of a life lost, the much larger number of non fatal accidents where injuries and material damage are caused generates considerable costs.

While alcohol is a factor in 36% of fatal road accidents in Ireland and 30% of all road accidents, it could not be asserted with certainty that all of those accidents would be avoided if the driver or pedestrian had not been drinking. Many accidents have multiple causes of which alcohol may be one, but not necessarily the crucial one. For this reason it would probably be an overestimate of the cost of alcohol related road accidents to ascribe 30% of the total cost in 2003 of €1.44bn solely to alcohol.

Taking Bedford's figure, we can estimate that 108 of the 301 fatal accidents in Ireland in 2003 were alcohol related. Using the cost of a fatality figure of €2.2m (Goodbody, 2004) gives a cost of alcohol related fatal accidents of €240m. This represents 16% of the total cost of road accidents in 2003. Ascribing a conservative 20% of all non fatal road accidents to alcohol as a main cause and updating the Goodbody estimates to 2007 prices gives a cost for non fatal accidents of €290 million. Adding this to the cost of fatal alcohol related accidents gives a total cost of all alcohol related accidents of €530m or 37% of the total cost of all road accidents in 2007.

6 Alcohol and crime

6.1 Alcohol related offences

The link between alcohol and a range of crimes has been noted for centuries and all developed countries have legislation covering a range of alcohol related crime. Of these the most commonly prosecuted are drinking and driving related offences and public order offences. Alcohol is also involved in many assaults including sexual assaults and rape and in domestic violence and in murder and manslaughter. There are also many offences under liquor licensing legislation relating to the sale and consumption of alcohol which result in numerous prosecutions both of licence holders and drinkers.

There has been a large increase in all alcohol related crime since the early 1990s as documented in Hope's (2008) study of alcohol related harm. The incidence of all public disorder type offences, most of which are alcohol related has risen from 77 per 10,000 of the population in 1998 to 139 per 10,000 of the population in 2005. (Garda Annual Reports) The true incidence of such offences is greater than this, as not all public order type offences are prosecuted but most require the use of Garda resources.

6.2 Other crimes in which alcohol is a contributory factor

In addition to specific alcohol related offences alcohol contributes to many other crimes including homicide, assault, theft and burglary. The annual reports of An Garda Síochána show a dramatic increase in the proportion of headline recorded offences in which alcohol was recorded as a contributory factor between 2000 and 2007.

The report *Alcohol and Homicide in Ireland* (1996) showed that 45% of perpetrators and 41% of victims of homicide were intoxicated and in 30% of cases both were drunk. Dooley (2001) found that 40% of perpetrators and victims of homicide in Ireland in the period 1972 to 1991 were intoxicated. The level of homicide has increased significantly since 1991 and the accounts of homicide trials published in newspapers show that alcohol plays a part in many of them. In their survey of domestic abuse in intimate partner relationships in Ireland Watson and Parsons (2005) found that alcohol was a trigger for abusive behaviour in 34% of cases.

A number of studies have shown that approximately 50% of both perpetrators and victims of sexual assault were drinking alcohol at the time of the assault. In a presentation to a conference on women's health organised by the Irish College of General Practitioners Dr Mary Holohan (Holohan, 2006) of the Sexual Assault Treatment Unit in the Rotunda Hospital showed that 60% of women presenting themselves at the unit had taken significant amounts of alcohol before the assault.

A survey commissioned by Alcohol Action Ireland (2004) found that 44% of those surveyed had been injured, harassed or intimidated as a result of another person's use of alcohol. Many alcohol-related crimes are not reported to the Gardai so that the figures in the Garda Reports underestimate the extent of such crime. In the case of some crimes such as domestic violence and sexual offences, the role of alcohol in the crime is not recorded. It would therefore be an underestimate of the cost of alcohol related crime to consider only those crimes where alcohol is recorded as a factor in conviction for the crime.

6.3 Cost of alcohol related crime in Ireland

In Ireland at present, good data is available on crimes where alcohol is a causal factor but the available data on crimes where alcohol is a contributory factor is less comprehensive. To accurately estimate the cost of alcohol related crime it would be necessary to estimate the cost of policing such crime, the costs to the courts system of dealing with such crime and the cost to the prison system of detaining prisoners convicted of alcohol related crime. The available data on the costs to the criminal justice system in dealing with alcohol related crime are not adequate to allow a direct computation of alcohol related crime.

Scotland has similar levels of alcohol consumption and in their report *Alcohol Misuse in Scotland: Trends and Costs* (2001) the Scottish used data available for Scotland directly to calculate the costs of alcohol related crime in Scotland. Their calculations show that in Scotland in 2001, 26% of the cost of the police service could be accounted for by alcohol related crime and 7% of the cost of the prison service was incurred on prisoners convicted of alcohol related offences. (Most alcohol related offences are dealt with in the lower courts and do not result in a prison sentence which explains the fact that alcohol related crime accounts for a larger share of police costs than of prison costs).

The Scottish study found that 9% of court costs were incurred in dealing with alcohol related crime. This figure seems high in view of the fact that most alcohol related crime is dealt with in lower courts where costs per case are relatively low. The figure may be due to the fact that the overall level of crime, including alcohol related crime, is higher in Scotland than in Ireland.

In view of the similarities in terms of alcohol related harm between Ireland and Scotland it would be reasonable to assume that the cost to the criminal justice system in both countries is similar. Because the crime rate in Scotland is higher than in Ireland, the proportions of expenditure in Ireland are likely to be somewhat lower. Adjusting the Scottish figures downward to take account of Ireland's lower crime rate gives the following result:

	Scotland	Ireland (assumed)
Cost of policing alcohol related crime as a percentage of total policing costs	16 %	12%
Cost to prison service of alcohol related crime as a percentage of total prison costs	16%	12%
Cost to the courts of alcohol related crime as a percentage of total cost of courts	9%	7%

Applying the above proportions to Irish government spending on police, prisons and courts in 2007 gives the following figures:

	€ million
Cost of Garda Síochána resources devoted to alcohol related crime	191
Cost to prison service of alcohol related crime	51
Cost to the courts of alcohol related crime	77
Total Cost of alcohol related crime	€319

6.4 Other costs of alcohol related crime

In addition to the costs to society of detecting and punishing alcohol related crime, costs are also incurred by the victims of such crime in the form of trauma, injury and even death. Other costs include the cost of property lost through burglary and the cost of criminal damage. Victims of crime are likely to be absent from work and their output is therefore reduced. Substantial costs in the form of security systems are also incurred in anticipation of crime. In the UK study, these costs are much greater than the cost to the criminal justice system. The ratios are as follows, taking the costs to the criminal justice system as 1.00.

Criminal justice system costs	1.00
Property/ health and victim services costs	1.40
Costs in anticipation of crime	0.85
Crime cost of lost productive output	0.55
Emotional impact costs	2.70

Source: Derived from table 39, *Alcohol Misuse. How much does it cost?* (2003).

As there is insufficient data to calculate these costs of crime directly in Ireland, an estimate can be made by applying the UK ratios of these costs to the costs to the Irish criminal justice system.

Total Costs of Crime in Ireland 2007	€million
Criminal justice system costs	3.19
Property/ health and victim services costs	435
Costs in anticipation of crime	264
Crime cost of lost productive output	171
Total Crime Costs	€1.19 billion

As this figure is just over 6% of the UK costs it seems a credible estimate, given the comparative size of the two societies.

6.5 Costs of crime prevention and of criminal damage.

While adequate data to calculate the cost to society as a whole of crime prevention and criminal damage are not available for Ireland, a report by the Irish Small and Medium sized Enterprises Association (ISME, 2010) estimated the cost of crime to small and medium businesses of €1.35 billion (ISME, 2010); €874 million of this comprised costs in anticipation of crime. The Institute of Alcohol Studies in the UK estimates that up 30% of crime is alcohol related which would give a loss to small and medium sized enterprises due to alcohol related crime of €357m. This figure which relates only to small and medium enterprises, suggests that the estimate given above for “Property health/victim services costs” and “Costs in anticipation of crime” are reasonable.

6.6 Emotional costs of crime

There are other substantial costs of alcohol related crime that are difficult or impossible to cost. Many people, both drunken criminals and their victims, suffer both short and long term emotional trauma, pain and suffering and bereavement as a result of alcohol related crime. A day spent in the criminal courts gives a disturbing picture of the human cost of alcohol related crime. These costs, though difficult to estimate, are likely to be much greater, as the UK study suggests, than the more quantifiable costs. No attempt is made to estimate the emotional cost of crime in Ireland as this is the most difficult to quantify. It should be noted that in the UK study the emotional cost of crime is almost three times the direct cost to the criminal justice system.

In addition to the pain and suffering caused by reported alcohol related crime, the cost of non reported crime, particularly domestic violence, should be taken into account. Many minor alcohol related crimes such as vandalising of private and public property, minor theft etc are either unreported or undetected. The figure calculated above for the cost of alcohol related crime significantly underestimates the true cost.

7 The impact of alcohol on output and employment.

7.1 Alcohol and work performance

Consumption of alcohol affects the performance of workers in several ways:

- Any significant amount of alcohol in the body increases the likelihood of mistakes and errors of judgment and increases the likelihood of accidents.
- The after-effects of drinking to excess (hangovers) include inability to concentrate, or work at normal pace. Workers suffering hangovers are more likely to be absent from work.
- Dependent drinkers suffer medical, social and psychological problems which are likely to impair their work performance and attendance. Workers dependent on alcohol are likely to experience increased sickness absences and to cause difficulties for fellow workers.
- Long term heavy drinking is likely to lead to unemployment and early retirement which leads to increased

social welfare spending.

Problems relating to alcohol as well as drug dependence are more prevalent in the unemployed and economically inactive population than among the employed. The links between problem alcohol use and unemployment is complex. While unemployment increases the risk of becoming dependent on alcohol, alcohol dependence increases the risk of being unemployed. Figures produced by the International Labour Organisation indicate that at a global level 3-5% of the average work force are dependent on alcohol and 25% are at risk of dependence from heavy drinking (ILO, 1995).

Higher than average alcohol consumption, and its related problems, are associated with certain industries and occupations. These include the alcoholic drinks and catering industries; the shipping industry; the military; doctors; lawyers and journalists. The higher incidence of alcohol problems in these industries and occupations can be explained by the easy availability of alcohol; social pressure to drink and lack of supervision.

7.2 Alcohol related absenteeism

Gathering data on alcohol related absenteeism is difficult as many workers suffering the effects of alcohol consumption may present doctors certificates giving some other illness as the cause of absence. In surveys of the causes of absences from work, workers are likely to understate alcohol related absences. IBEC's 2004 survey on absenteeism found that 3% of illness absence was due to alcohol as a main problem and 13% had some alcohol connection. For absences not due to illness, 6% had alcohol as a main cause and 24% were alcohol related. A total of 14 million days were lost due to absenteeism according to the survey. Taking the figure of absenteeism due to illness for which alcohol is the main cause gives 420,000 days lost in 2003 due to alcohol misuse. This is an underestimate as many absences due to alcohol are like to be attributed to other reasons. If the UK figure of 7 days absent per worker due to alcohol were applied to the 77% of the Irish labour force who drink alcohol the number of days lost would be close to 1 million.

The absenteeism estimated by IBEC resulted in a loss of output valued at €1.5bn. The IBEC survey deals mainly with the private sector and the public sector is more labour- intensive and more tolerant of absenteeism. Public sector employment is 20% of private sector employment which suggests that the total value of lost output should be €1.8 billion. As public sector employees are more highly paid than workers in the private sector it would not be unreasonable to assume that total lost output due to absenteeism in the public and private sectors amounts to €2bn.

Estimating the total number of days lost or value of output lost due to alcohol related causes requires taking a figure between the 3% and 13 % for illness absences due to alcohol and a figure between 6% and 24% for absences not due to illnesses that are alcohol related. A reasonable compromise would be to assume that alcohol is a contributory factor to 15% of all absences. This gives a figure of €300 million for the value of lost output in the private and public sectors in 2004 which adjusted for 2007 prices gives an estimate of €330 million.

7.3 Alcohol and industrial accidents

The Health and Safety Authority's *Report on the Economic Impact of the Legislation on Health and Safety at Work* (2004) estimated conservatively that lost output due to work related accidents was valued at €1.8bn. The study did not estimate the proportion of alcohol related accidents at work but a UK Study (Alcohol Concern, 2000) found that up to 25% of accidents at work are related to alcohol. Applying this figure to the €1.8bn output loss in Ireland would give a figure of €450 million lost output due to alcohol related accidents. Using a more conservative figure of 10% of accidents being due to alcohol gives a lost output figure of €180 million which adjusted for 2007 prices gives €197 million.

7.4 Alcohol related unemployment and disablement

Alcohol misuse increases the likelihood of a worker being unemployed in both the short and long term. Workers whose performance is affected by alcohol are less likely to be retained in work and less likely to re-enter the labour force if they leave it.

Several UK studies have attempted to quantify the effects of problem alcohol use on output and employment. Terza (2002) found that for both men and women problem alcohol use results in reduced unemployment and increased unemployment. MacDonald and Shields found that being a problem drinker leads to a considerable reduction in the probability of working by between 7% and 31%. The Scottish study (2001) calculated that the excess unemployment rate in Scotland was 3% for men and 1% for women.

Alcohol related illnesses and accidents at work result in increased spending by government on unemployment benefit and disability benefit. Unlike lost output, these costs are not truly costs to society as a whole but are transfer payments from taxpayers to benefit recipients. If such alcohol related benefits did not have to be paid, the level of overall taxation could be reduced or spending on other areas could be increased.

7.5 Cost of premature mortality

Problem alcohol use leads to premature mortality for many people in the labour force and therefore reduces output. The number of working years lost for those who die prematurely from alcohol use can be calculated and an economic value put on the output they might have produced if they remained in the workforce until age 65. This is what might be called the tangible cost of premature mortality. A major ethical problem with this method is that the life of a highly paid professional would be of greater value than that of an unskilled worker. Another ethical problem arises from the fact that a person who dies prematurely from problem alcohol use will not incur pension or healthcare costs to the Exchequer in old age and, to be consistent, this cost saving should be deducted from the value of the person's lost output. (The same issue arises in the case of smokers who die prematurely).

The psychological effect of the premature death of a person who misuses alcohol is borne by the deceased and his or her family and friends. The psychological effects of premature death can be estimated using the Willingness-to-Pay (WTP) method which values human life according to what individuals would be willing to pay for a change that reduces the probability of illness or death (Mueller and Reutzel, 1984). Estimates produced by the WTP method are usually dramatically larger than the cost of material production lost estimated using the human capital method and there are great difficulties in applying the WTP method.

The Scottish study (2001) estimated that of the total cost of alcohol related absenteeism, unemployment and premature mortality accounted for 50 per cent of the total. The UK study (2003) estimates the cost of lost output due to absenteeism, reduced employment, reduced efficiency and premature mortality. Premature mortality accounts for two thirds of total costs of lost output. These figures are high and are based on contentious assumptions regarding the value people put on reductions in mortality risk from problem alcohol use.

Sufficient data is not available to calculate accurately the cost of premature mortality in terms of lost output in Ireland and attempting to use the WTP method presents considerable difficulties. However, as the mortality costs for road accidents and suicides given above are based on the WTP method, it would be inconsistent to ignore the cost of other types of alcohol related mortality. In the Scottish study (2001) the cost of premature mortality is one third of the more tangible costs of output lost due to alcohol related absenteeism and unemployment. Estimating the cost of premature mortality as one third of the cost of alcohol related lost output in Ireland gives a figure of €110 million for 2007.

8. Human costs of problem alcohol use

As the many studies cited above show, those who misuse alcohol are more likely to suffer accidents and illness, to commit suicide, to be less productive at work, to be involved in road accidents and to commit crimes and be the victims of crime. Much of the cost of misuse is borne by the person who misuses alcohol but society also bears a great deal of the cost and attempts have been made to estimate some of these costs above.

Problem alcohol use imposes huge costs on a misuser's family and friends and work colleagues. The dependents of those who misuse alcohol suffer a reduction in their living standards as well as psychological stress and in some cases violence. The partners of problem drinkers are more likely to suffer mental and physical illness which will result in increased spending on health care. The children of parents who abuse alcohol have high levels of behavioural difficulty, perform less well at school and are more likely to suffer emotional problems (Barber and Crisp, 1994). Family members who are not dependents suffer in some cases the loss of a child, brother or sister to alcohol related violence or road accidents.

While the costs to those affected by the problem alcohol use of family members, friends or colleagues are impossible to quantify that does not mean these costs should be ignored. The drinks industry constantly argues that the costs to society of problem alcohol use are unreliable or exaggerated because so many costs are hard to quantify. It is clear from the huge volume of evidence of the external costs of alcohol, that though cost estimates may be tentative, when the unquantified human costs are considered; all estimates of the external costs of problem alcohol use greatly understate the true cost of problem alcohol use to society.

9. The overall cost of problem alcohol use to Irish society

9.1 The composition of total costs

As stated in the introduction this study attempts only to estimate what economists call the external costs of problem alcohol use. These are costs to society as a whole which would be avoided or reduced if problem alcohol use could be reduced. The study has largely followed the methodology used in the studies of the cost of problem alcohol use in the UK and in Scotland as these countries are culturally similar to Ireland and have similar patterns of problem alcohol use.

The costs that were estimated were; the cost of problem alcohol use to the health care system; the cost to society of alcohol related crime; the cost of alcohol related road accidents; the cost of lost output due to

alcohol related absenteeism; the cost of alcohol related suicides and the cost of lost output due to alcohol related accidents at work. These costs for 2007 are as follows:

	€million	% of total costs
Cost to the health care system of alcohol related illnesses	1,200	32
Cost of alcohol related suicides	167	5
Cost of alcohol related road accidents	526	14
Cost of alcohol related crime	1,189	32
Cost of output lost due to alcohol related absence from work	330	9
Cost of alcohol related accidents at work	197	5
Cost of alcohol related premature mortality	110	3
Total	€3,719	100

The percentage breakdown of costs above is broadly in line with Baumberg and Anderson's (2006) estimates for the whole of the EU. Although Baumberg and Anderson cover more costs than in this study, if the costs that are comparable in both studies which are crime costs, health costs, and costs of lost output and of road accidents are compared, they are broadly similar to the percentages above.

The total cost of €3.7 billion represented 1.9% of GNP in Ireland in 2007. Baumberg and Anderson (2006) in their review of studies of the social cost of problem alcohol use in the EU calculated the total *tangible* social cost of problem alcohol use to be 1.3% of GDP with a range of 0.9% to 2.4% (GNP is the more appropriate measure in Ireland as GDP is greater than GNP due to large outflows of income to foreign owned companies). The studies for England and Wales and for Scotland estimate the social costs of problem alcohol use as 1.7% of GDP for England and Wales in 2001 and 1.5% for Scotland in 2003. These figures are likely to have risen since the studies were done as both countries have experienced significant increases in alcohol consumption and alcohol related harms since the early 2000s. The Northern Ireland study estimates the social cost of problem alcohol use in Northern Ireland in 2008 to be 1.8% of GDP.

9.2 Limitations of the cost estimates

As with all other studies of the social costs of problem alcohol use, problems of methodology and availability of data mean that the cost figures presented are very tentative. As Baumberg and Anderson (2006) show, differences in methodology and in the availability of data make comparisons between countries difficult. The estimates in this study are broadly in line with those for other EU countries though the estimate that includes tangible costs put the Irish costs as a percentage of GNP at the upper end of the scale.

A study such as this is not required to persuade an informed observer of contemporary Irish society that problem alcohol use is imposing a large cost on Irish society. These costs should be of great concern to policy makers as they add substantially to public spending on health care and on dealing with the consequences of crime. A distinction must be made between tangible costs, which if reduced yield resources that are available to the community for consumption or investment purposes, and intangible costs consisting mainly of the pain and suffering caused both to those who misuse alcohol and those who are affected by misuse. These costs are very difficult to calculate and no attempt is made to do so in this paper but if a monetary value could be put on the pain and suffering to those affected by problem alcohol use they would be far in excess of the tangible costs.

10 Effects of pricing and taxation of alcohol on alcohol consumption

10.1 Introduction

The regulation of alcohol taxes and prices is the most widely used strategy to control alcohol consumption and consequently alcohol related problems. Babor et al (2003) point to the evidence from studies in many countries that show that raising the price of alcohol through taxes or other measures lead to reductions in alcohol use and related problems.

The evidence on the relation between the price of alcohol and consumption and between price and harm comes from econometric studies and from natural experiments where changes in alcohol pricing or taxation led to changes in consumption or harm compared to control jurisdictions (such as another state in the country) where prices or taxes were not changed.

10.2 Impact of alcohol price on consumption of alcoholic beverages

Economists use the concept of price elasticity of demand to analyse the relationship between the price of a good and the demand for it. Elasticity is measured by comparing the percentage change in price with the resulting percentage change in demand. When the percentage change in demand is greater than the percentage change in price, the product is said to be **price elastic**. When the percentage change in demand is less than the percentage change in price, the product is **price inelastic**. Because of its addictive nature, demand for alcohol is price inelastic. This means that if the price of alcohol rose, by say 10%, demand would fall by less than 10%.

In a meta-analysis of 132 studies of the relationship between alcohol prices and consumption, Gallet (2007) shows that all studies reviewed find that an increase in alcohol price generally leads to a decrease in alcohol

consumption while a decrease in price leads to an increase in consumption.

Gallet (2007) reports median price elasticities for Beer (0.36); Wine (-0.70); Spirits (-0.679) and Alcohol (-0.497) This means that if the price of beer were increased by 10% beer consumption would fall by 3.6%; if the price of wine were raised by 10% wine consumption would fall by 6.8%; and if the price of spirits were increased by 10%, spirits consumption would fall by 9.8%.

In examining the effect of the price of alcohol on consumption, it is important to use the *real* price, which is the money price adjusted for changes in income and the overall price level. If the money price of alcohol rises less rapidly than income and prices in general, the real price declines and vice versa.

Natural experiments show that increases or decreases in price result in significant decreases or increases in consumption respectively. Zhang and Caswell (1999) found that in New Zealand beer consumption declined when real price increased during the early 1990s. During the same period in New Zealand a decrease in the real price of wine led to an increase in consumption. In Ireland in 2002 an increase in the excise duty on spirits of 20%, led to a 20.1% reduction in consumption.

Changes in alcohol consumption are affected by changes in income as well as changes in prices. There is therefore a strong case to be made for governments to ensure that taxation or price increases match or exceed rises in personal disposable income. The studies quoted above show that alcohol consumption will fall as a result of an increase in price. Babor et al (2003), show that the effects of price changes on alcohol consumption are substantially larger than other alcohol interventions. As a large part of the price of alcohol consists of tax, the government can change the price of alcohol in order to influence consumption. Alcohol tax increases are passed on as equivalent or sometimes greater price increases making tax a very effective instrument for influencing alcohol consumption.

10.3 Impact of alcohol price on underage and problem drinkers

The studies reviewed by Meier et al (2008) show that there is strong evidence that young drinkers, binge drinkers and harmful drinkers tend to choose cheaper drinks. Young people are likely to be especially sensitive to price as they have little money of their own and those young people who drink heavily may not be addicted or at least not so addicted that they are less responsive to price changes. Laixuthai and Chaloupka (1993) found that raising beer prices through taxation reduced both the number of young drinkers and the number

who drink heavily. Higher beer prices were found to significantly reduce the likelihood of drinking, drinking frequency and binge drinking among underage drinkers.

10.4 Discounted prices of alcohol products

Large retailers are increasingly using the discounting of alcohol at low prices or even below cost to attract customers to buy more profitable goods. Alcohol is used as a heavily advertised loss leader. In response to this there have been calls for a minimum price to be set for alcohol. The UK's Chief Medical Officer has recommended that minimum prices for alcohol be introduced in order to tackle the very high levels of binge drinking among young people and rising levels of alcoholism among older people (*The Guardian*, 15 March 2009).

There have been relatively few studies of the effect of minimum prices on alcohol related harms. Gallet et al (2007) conclude that there is "low quality but demonstrable specific evidence to suggest that minimum pricing might be effective as a targeted public health policy in reducing consumption of cheap drinks".

In Ireland until 2006 below cost selling of alcohol was prohibited. The removal of this prohibition led to large retailers selling alcohol at discounted prices. This in turn has led to an increase in sales of alcohol for home consumption but did not lead to an increase in overall consumption.

The Competition Authority in its submission to the Alcohol Strategy Group argues against setting minimum prices for alcohol products (Competition Authority, 2008). The Authority argues that minimum prices make the sale of alcohol more profitable and thus encourage its sale. The Authority argues that increasing taxation on alcohol is preferable as a means of reducing consumption rather than setting minimum prices.

10.5 The impact of taxation and pricing of alcohol on alcohol related harm

There is a substantial body of research to show a link between alcohol prices and taxation and alcohol related harm. In their meta-analysis Meier et al (2008) reviewed 24 studies of the effect of taxation and or price on alcohol related harms. The majority of studies reviewed found a link between tax and alcohol related harms. Several of the studies reviewed found that increasing the price of alcohol reduces road traffic accidents and fatalities among drivers of all ages but particularly for younger drivers. Increases in alcohol prices reduce intentional and accidental injuries and sexually transmitted diseases. Higher alcohol prices also reduce all alcohol related crimes.

10.6 Alcohol price trends in Ireland

While the money price of alcohol has risen significantly over the past 15 years, the real price which is the price adjusted for changes in income, has fallen by 50 per cent since the mid 1990s because incomes have risen faster than nominal alcohol prices and excise duties have declined in real terms.

Ireland imposes relatively high excise duty rates on alcohol but the real value of the duties have fallen steeply since 1996. There have been only three increases in excise duty since 1994 and the duty on beer has remained unchanged since 1994. The duty on spirits was raised in 2003 but was lowered in the 2010 Budget. Excise duty on alcohol as a percentage of total tax receipts has fallen from 7.3% in 1985 to 2.4% in 2007 (*Statistical Reports of the Revenue Commissioners, various years*).

The failure to increase the excise duty on alcohol has resulted in the total tax take on alcohol as a percentage of its price falling significantly over the past 20 years. Total tax take, which includes excise duty and VAT, as a percentage of the price of a pint of beer fell from 49% in 2008 to 29% in 2008. The total tax as a percentage of the price of a standard measure of spirits fell from 46% to 33% during the same period (*Statistical Reports of the Revenue Commissioners, various years*).

10.7 The case for increasing the price for alcohol

The decline in the real price of alcohol in Ireland has resulted in alcohol becoming significantly more affordable, particularly for young people. There is considerable evidence that increasing the price of alcohol reduces alcohol related harms and the government should seriously consider raising the rate of excise duty on alcohol as a means of reducing harms.

The European Public Policy Alliance argue that if a common EU tax was used to raise the price of alcohol by 10%, over 9,000 deaths would be prevented and approximately €13 billion would be raised in revenue. (European Public Policy Alliance, 2009) Alcohol has become more affordable because the money price has remained stable or declined while incomes have risen and consumption has risen with incomes. This has led to suggestions that the price of alcohol should be controlled directly rather than indirectly through taxation. In Canada a minimum price policy was introduced in eight of the ten provinces over the period 1990-1998. Research by the Centre for Economics and Business Research (CEBR, 2009) found that alcohol consumption fell in the provinces which had implemented minimum prices compared to those which had not.

The Scottish Government proposed introducing a minimum retail price for alcohol products in the policy paper *Changing Scotland's Relationship with Alcohol: a Framework for Action* (2009). While the Scottish Government considers that a minimum price is possible under EU competition law, Baumberg and Anderson (2006) state that minimum prices are generally regarded as trade distorting by European institutions.

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