The economic and social costs of alcohol-related harm in Leeds 2008-09

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FOREWORD

Leeds is a vibrant and exciting city that has become a leading centre for the arts, leisure, culture and tourism. Alcohol is a major feature of the life of the city bringing economic benefits in terms of jobs and attracting visitors. I also recognise that alcohol can play an important and positive role in our social and family life, enhancing special occasions and time spent with friends.

However these benefits have a hidden cost. The misuse of alcohol across many of our citizens from young to old is leading to a steady increase in damage to health, crime and disorder, and to loss of work productivity. The services that we all pay for through our taxes, such as health, police, fire and rescue and ambulance are bearing a heavy price for the work they do in managing and reducing the harm caused by alcohol within our communities.

I am pleased to introduce this important report that makes clear the economic impact that alcohol is having on us all.

Organisations working in Leeds, including business and industry, must take the lead in making the reduction of harm caused by alcohol a priority - and we all have a responsibility and a part to play in promoting a sensible drinking culture that reduces violence and disorder, and improves health and wellbeing.

Councillor Mark Dobson

Chair Scrutiny Board – Health and Healthy Leeds Partnership

Executive summary

Alcohol plays an important role in society, being consumed by the majority of adults and making an important contribution to the economy. However, the consumption of alcohol has health and social consequences borne both by individuals and their families, and by the wider community - the cost of alcohol in Leeds to the NHS alone has been estimated to be in excess of £20 million per year. The purpose of this report is to present estimates of the wider economic and social costs of alcohol-related harm in Leeds.

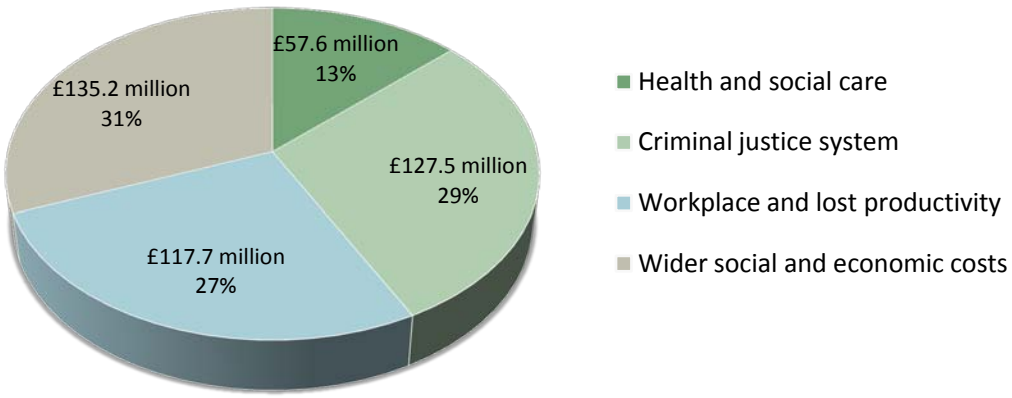
The economic and social costs of alcohol-related harm in Leeds 2008-09

Identifying the costs of alcohol-related harm is essential in informing decision-making across government and multi-agency partners regarding alcohol policy, investment in and commissioning of alcohol interventions at a regional and local level, and at an individual level, influencing lifestyle behaviour. Using cost of illness methodology this report attempts to identify and quantify, in economic terms, the impact of alcohol-related harm in Leeds through expenditure on:

- The costs of **health and social care** for people with alcohol-related ill health, including services provided by NHS Leeds and Leeds City Council;
- **Criminal justice system** costs for alcohol-specific and alcohol-related crimes;
- The costs of **productivity losses in the workplace** due to absenteeism, reduced productivity and premature mortality; and
- An estimate of the intangible or **human costs**, representing the wider impacts of premature death.

Alcohol also makes an important **contribution to the economy**, for example through the key role it plays within the leisure and tourist industry, and the report considers the contribution that the production, distribution and sale of alcohol makes to the Leeds economy.

The methods used to estimate the economic and social costs of alcohol-related harm in Leeds were based on approaches used in other costing studies, in particular those related to alcohol misuse. These methods aim to identify and measure all costs related to alcohol misuse, including the direct costs, indirect costs in the form of production losses, and intangible or 'human' costs. Estimates of the economic and social costs of alcohol-related harm in Leeds in 2008/09 totalled **£438.0 million** across the four categories as follows:



Alcohol consumption and expenditure in Leeds

Presented below is information on alcohol consumption among the general population of Leeds and household expenditure on alcohol.

- In Yorkshire and the Humber, three quarters of men and two thirds of women report drinking in the last week.
- Almost 40% of Yorkshire and the Humber residents drink more than the recommended daily maximums (2-3 units for women and 3-4 for men) on at least one day a week.
- Over 35,000 adults in Leeds may be classified as high risk drinkers; that is, men drinking more than 50 units a week and women drinking more than 35 units a week.
- Households in Yorkshire and the Humber spent more than the England average on alcoholic drinks, despite total household expenditure being less than the UK average.
- The estimated weekly spend on alcoholic drinks in households in Leeds is approximately £4.5 million, indicating a total spend of **£232 million each year** on alcohol in the city

The contribution of alcohol to the Leeds economy

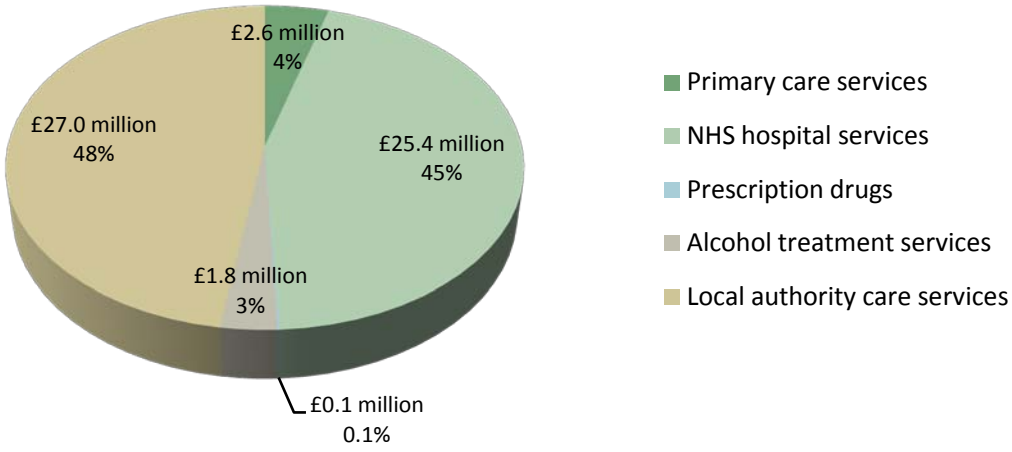
Figures on alcohol-related employment can provide a measure of the contribution that alcohol makes to the Leeds economy and the estimates presented below approximate the size of this benefit.

The majority of alcohol-related employment in Leeds is centred on jobs in pubs, bars and restaurants. Over the last decade, there has been an expansion in the city's entertainment and cultural scene and a corresponding increase in the number of music venues, bars, clubs and restaurants within Leeds city centre.

- In 2008, around 11,000 jobs in Leeds were related to the sale of alcohol, **3% of all jobs in Leeds**.
- The Gross Value Added from jobs related to alcohol retail in 2008 was between £144.4 and £167.1 million, approximately **1% of the total Leeds' GVA** for that year.
- However, the estimates presented are conservative and do not take into account the wider contribution that the night time economy and tourism make to the Leeds economy, sectors that are both closely linked to alcohol retail.

Health and social care

The estimated costs of health and social care for alcohol-related harm in Leeds in 2008/09 are presented below. The majority of the estimated costs arose from NHS hospital services and local authority care services.

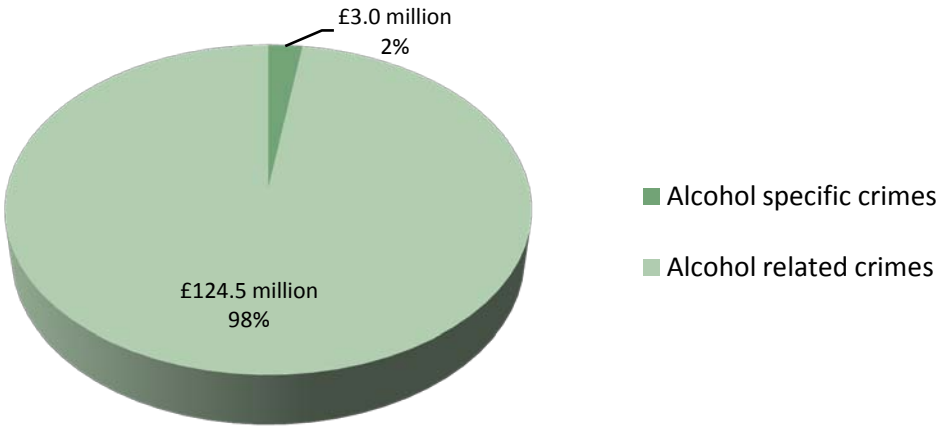


Expenditure on health and social care services was an estimated **£56.8 million** in Leeds in 2008/09. These costs comprised the following service elements:

- **£2.6 million** for the cost of primary care services, including over 96,000 alcohol-related consultations with GPs, practice nurses and other professionals;
- **£25.4 million** for the cost of NHS hospital services, including £13.1 million for inpatient hospital stays, £2.2 million for day hospital cases, £4.9 million for outpatient attendances, £0.7 million for A&E attendances and £4.3 million for ambulance journeys;
- **£0.1 million** on prescription drugs for treating alcohol dependence;
- **£1.8 million** on community and residential alcohol treatment services; and
- **£27.0 million** on local authority care services, including £26.8 million on child care social work and £0.2 million on adult services for alcohol misuse.

Criminal justice service

The estimated costs of alcohol specific and alcohol-related offences in Leeds in 2008/09 are presented below.

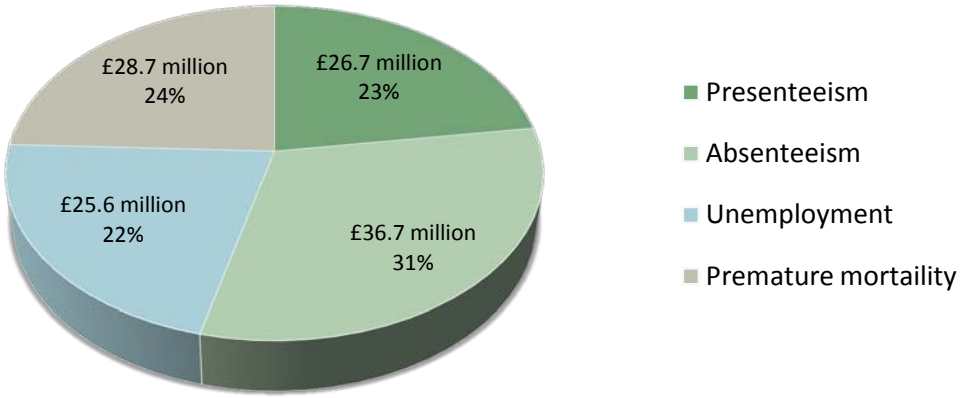


Expenditure on alcohol specific and alcohol-related offences was an estimated **£127.5 million** in Leeds in 2008/09.

- **£3.0 million** for the costs associated with alcohol specific crimes based on national estimates of £208 million.
- **£124.5 million** for the costs associated with alcohol-related crimes, with criminal damage and theft from shops comprising the majority of the offences committed. These costs were broken down across the following three categories:
  - **£8.3 million** spent in the *anticipation of crime*, including defensive expenditure and insurance administration costs;
  - **£96.3 million** arising from the *consequences of crime*, including the physical and emotional impact on victims of crime, the value of the stolen property, property damaged or destroyed and the costs of property recovery, in addition to the costs of victim services and lost output; and
  - **£19.9 million** in *criminal justice system costs*, including police activity, prosecution and court costs, the probation and prison service and other costs such as criminal injuries compensation.

Workplace and lost productivity

Excessive alcohol consumption affects the workplace through impaired performance at work ('presenteeism'), and by increasing the likelihood of employees being absent from work ('absenteeism'). In addition, heavy and dependent drinkers may be more likely to be unemployed. Alcohol also contributes to lost productivity in the workplace through premature deaths related to alcohol use.



Impaired performance at work

Reduced performance in the workplace due to hangovers resulted in costs to the Leeds economy of **£26.7 million** in lost output. Over 210,000 days were lost to hangovers in Leeds in 2008/09.

Sickness absence

Between 6% and 15% of working days lost to sickness may be attributed to alcohol misuse. The annual cost to the Leeds economy arising from sickness absence due to alcohol misuse was estimated to be between £21.4 million and £52.5 million, with a mid-point value of **£36.7 million**.

Unemployment

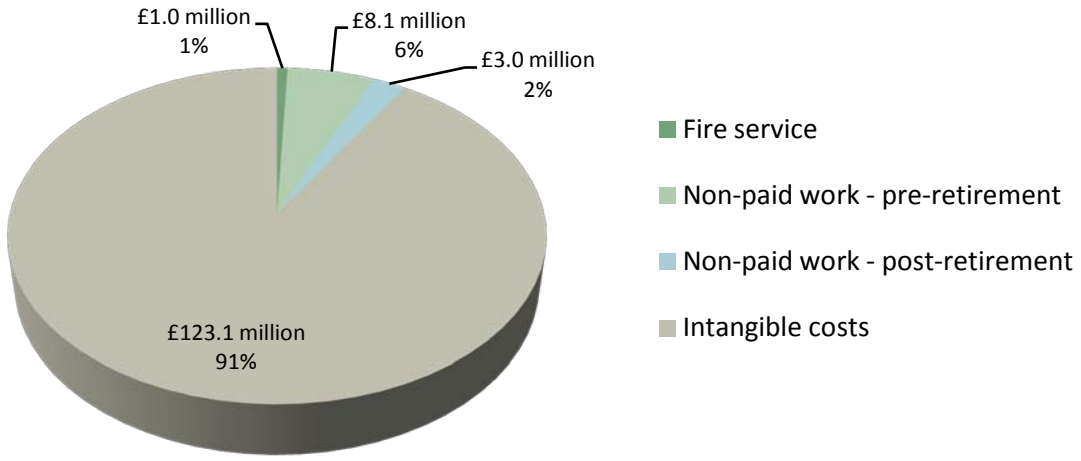
Being a problem drinker may lead to a reduction in the probability of working and over 230,000 days of employment were lost in 2008/09 in Leeds due to alcohol dependence. This represented losses to the Leeds economy of approximately **£25.6 million**.

Premature mortality

There were 140 alcohol-related deaths among the working age population of Leeds in 2007. Based on the reduction in expected years of working life and average earnings for employees in Leeds, the estimated cost of this lost output to the Leeds economy in 2008/09 was **£29.2 million**.

Wider economic and social costs

Premature deaths from alcohol misuse also reduce the contribution that non-participants in the workforce make through unpaid work and activities before and after retirement, and also cause intangible social costs through the pain, grief and suffering that premature death imposes on friends and family members.



Fire and rescue service

An estimated **£1.0 million** was spent on West Yorkshire fire and rescue service attending alcohol-related incidents in the Leeds area, including approximately £0.9 million attending alcohol-related house fires and in the region of £42,000 attending alcohol-related road traffic accidents in Leeds.

Lost value of non-paid work and activities before retirement

Based on estimates of the Leeds working age population not in work, an estimate of **£8.1 million** was calculated for losses of unpaid work and activities attributable to alcohol misuse.

Lost value of non-paid work and activities after retirement

There were 37 alcohol-related deaths between the ages of 65-74 years in Leeds in 2007, yielding an estimate of **£3.0 million** for losses of unpaid work and activities after retirement, such as child care, attributable to alcohol misuse.

Human costs

The potential value of a year of human life was assumed to range between £30,000 and £50,000. The human costs of alcohol misuse arising through premature mortality in Leeds were an estimated **£123.1 million**.

Conclusions

Alcohol misuse imposes a considerable burden on the Leeds economy, costing an estimated **£438.0 million** in 2008/09.

Of the total costs of alcohol-related harm, 13% were due to expenditure on health and social care services, 29% of costs were due to expenditure on crime and within the criminal justice system, 27% were due to lost productivity and 31% were due to the wider social costs of alcohol misuse.

It was not possible to calculate all of the costs associated with alcohol misuse, for example costs associated with cleaning up alcohol-related litter and the costs associated with school failure and reduced educational attainment were not included. It is therefore likely the costs presented underestimate the true burden of alcohol on the Leeds economy.

1 INTRODUCTION

Alcohol plays an important role in society, being consumed by the majority of adults and making an important contribution to the economy, for example through the key role it plays within the leisure and tourist industry.[2] Individuals derive pleasure from consuming alcohol and it can act as a catalyst in social interactions and leisure experiences. In addition, there has been much debate about the beneficial health effects of alcohol.[3] However, the consumption of alcohol also has both health and social consequences and alcohol-related harm presents one of the biggest challenges facing public health and health care systems.

The Leeds Alcohol Strategy for 2007-10[4] estimated that the cost of alcohol in Leeds was £23.13 million per year to the NHS alone. Estimating the proportion of mortality and morbidity attributable to alcohol, crime and offences and productivity losses related to alcohol use enables us to begin to quantify in economic terms the true impact of alcohol-related harm on society (including health and social care, crime, fire and rescue services, and economic productivity). Alcohol-related social costs or 'externalities' are imposed on society when alcohol consumption has negative impacts on unrelated third parties, for example, through violence or threatening and anti-social behaviour. The costs of alcohol use may also include wider, intangible costs such as fear or concerns about alcohol-related violence in the community.

The purpose of this report is to present estimates of the economic and social costs of alcohol-related harm in Leeds. Identifying these costs is essential in informing decision-making across government and multi-agency partners regarding alcohol policy, investment in and commissioning of alcohol interventions at a regional and local level, and at an individual level, influencing lifestyle behaviour. Cost-of-illness (COI) studies, also known as social cost or burden-of-illness studies, investigate both the direct and indirect costs incurred due to an illness or condition from a societal perspective and they are a useful starting point for demonstrating the 'size of the problem' to policy makers.

2 ALCOHOL AND LEEDS

2.1 Alcohol consumption

In Yorkshire and the Humber, 75% of men and 59% of women drank in the last week, with 19% and 13%, respectively reporting to have drunk alcohol on more than 5 days in the last week.[5] The government's daily guideline for drinking are 2-3 units for women and 3-4 for men, and 39% of residents in Yorkshire and the Humber reporting drinking above these daily maximums on at least one day. In addition, 25% reported binge drinking[i] on at least one day (29% of men and 21% of women), a rate higher than the national average of 18%. In 2007/8, the estimated number of adults who engaged in hazardous,[ii] harmful[iii] and binge drinking was significantly higher in the Leeds Local Authority area than the England average, and higher than the regional Yorkshire and Humber average.[6] Approximately 25% of adults in Leeds reported hazardous drinking and 7% reported harmful drinking.

2.1.1 Alcohol-related harm

For male residents in Leeds, alcohol causes an average 10.7 months of life lost and for female residents, an average 4.7 months of life are lost. This compares with 5.1 and 3.5 months lost among male and female residents in West Oxfordshire in the South East of England, respectively. In 2008/09 Leeds had approximately 12,800 alcohol-related hospital admissions (a directly standardised rate of 1,561 per 100,000). This rate is lower than the average rate for England (1,583) but higher than the regional rate for Yorkshire and the Humber (1,525). As shown in Figure 1, the alcohol-related hospital admission rate for Leeds has risen steadily since 2002/03, with 2008/09 showing an increase of 15% from the previous year. Leeds is ranked in the worst quartile nationally for 10 out of the 23 alcohol indicators included in the Local Alcohol Profiles for England.

Box 1: Calculation of the number of high risk drinkers in Leeds

Based on national estimates from the General Lifestyle Survey 2008, 7% and 4% of men and women, respectively, are classified as high-risk drinkers*.

Applying this to the mid-year population estimates of adults in Leeds (n=646,500), an estimated 22,110 men and 13,226 women may be classified as high risk drinkers.

*Drinking more than 50 units per week for men and more than 35 units per week for women

[i] Defined here as drinking 6-8 units of alcohol or more in a single session.
[ii] Drinking that puts people at risk of physical and psychological harm.
[iii] Drinking that is likely to lead to physical or mental harm.

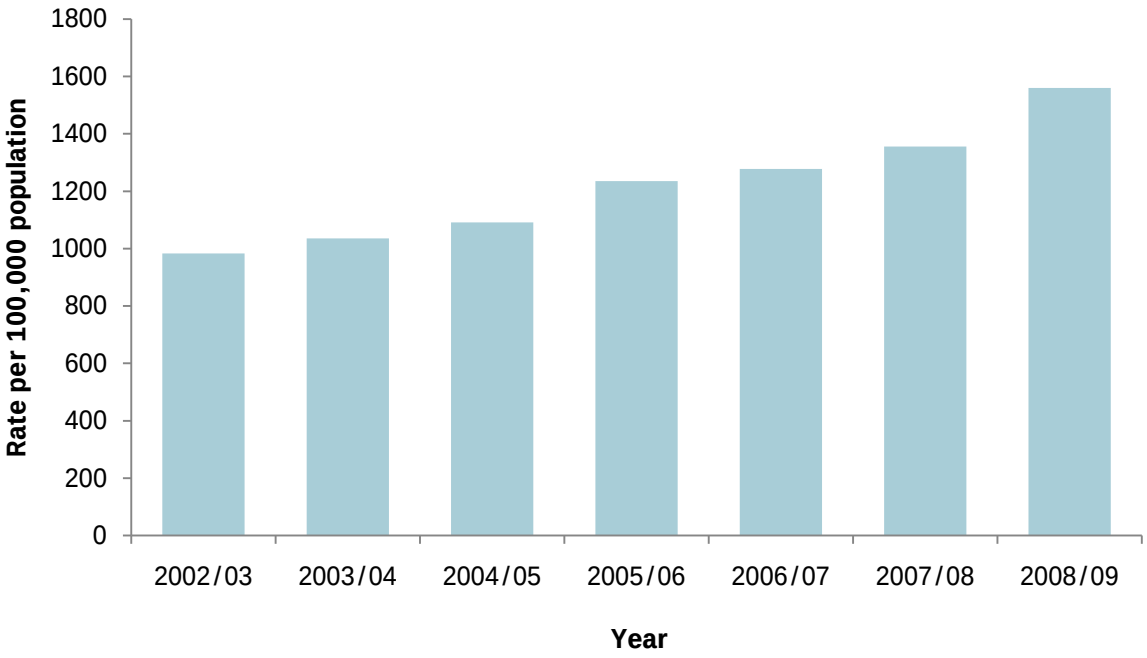


Figure 1. Trends in alcohol-attributable hospital admissions in Leeds (rate per 100,000 population)

2.1.2 Alcohol dependency and treatment

In 2007, the prevalence of alcohol dependence in the past six months among residents of Yorkshire and the Humber was 11.2% among men and 3.1% among women. In 2008/09, 1,889 clients received treatment for alcohol misuse in Tier 3 and Tier 4 agencies in Leeds.

2.2 Household expenditure on alcohol

Over the last two decades, there has been an increasing trend in the affordability of alcohol.[7] For example, in comparison to 1980, alcohol was 70% more affordable in 2009. In addition, purchases of alcohol for consumption in the home have increased overall since 1992, while purchases of alcohol for consumption outside the home have decreased.

In 2006-2008, the average household expenditure on alcoholic drinks in Yorkshire and the Humber was £14.80 per week (60% bought and consumed on licensed premises) amounting to 3.6% of total weekly household expenditure.[8] Although total household expenditure in Yorkshire and the Humber was less than the UK average, as shown in Figure 2, households in the region spent more than the England average (£14.30) on alcoholic drinks. Based on the number of households in Leeds from the 2001 Census (n=301,614), the estimated weekly spend on alcoholic drinks in Leeds is approximately £4.5 million, indicating a total spend of £232 million per annum on alcohol in the city, of which approximately £139 million is spent in on-licensed premises.

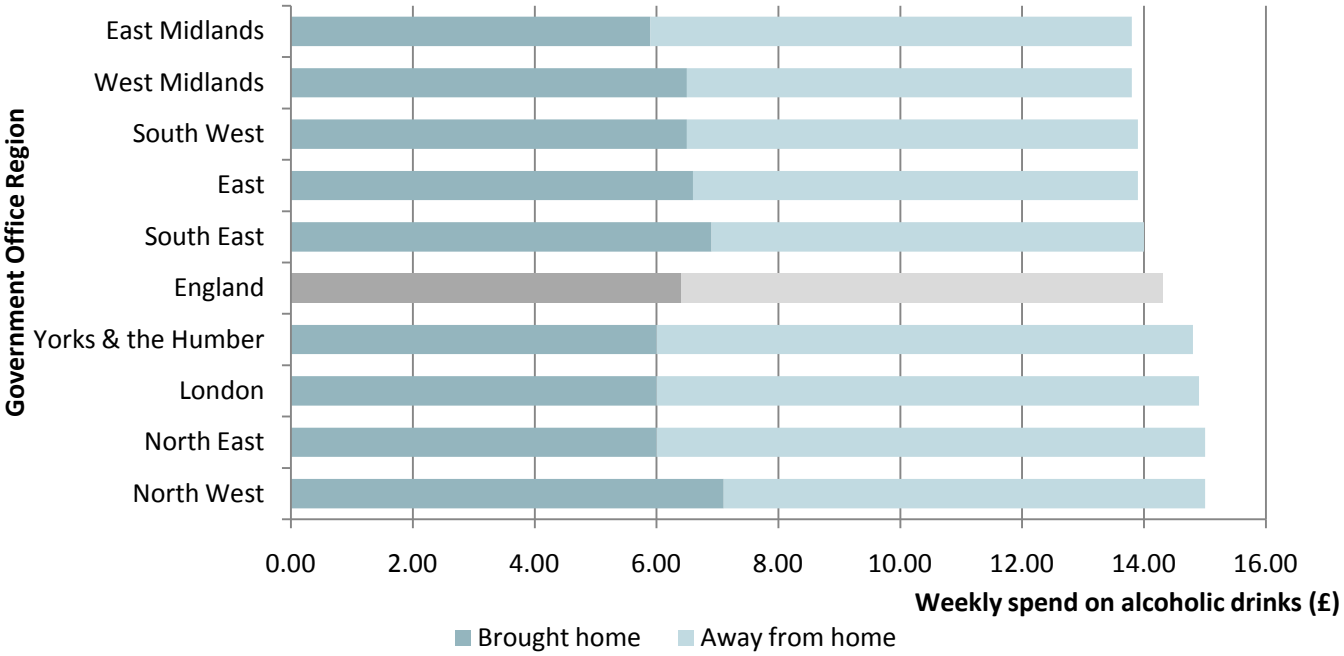


Figure 2. Weekly spend on alcoholic drinking by English Government Region, 2006-2008

2.3 The contribution of alcohol to the Leeds economy

Figures on alcohol-related employment can provide a measure of the contribution that alcohol makes to the Leeds economy, however, they do not provide a measure of the social benefits of alcohol, which lies in its consumption.[9] It should also be noted that the direct relationship between alcohol consumption and employment is unclear, and that the effect of drinking levels on employment levels in industries linked to alcohol may be relatively weak.[10]

In 2008, total employment in the Leeds Local Authority Area (LA) was 417,000 with 133,000 employees based in Leeds City Centre.[11] The majority of alcohol-related employment in Leeds is centred on jobs in pubs, bars and restaurants, and of August 2009, there were 281 licensed premises within Leeds City Centre as shown in Table 1. Employment in other industries linked to alcohol, including the production, distribution and retail of alcoholic drinks, accounted for a smaller share of alcohol-related employment in Leeds.

Table 1. Number of licensed premises in Leeds city centre, August 2009

Type	Number of licensed premises
Bars/ Public Houses	90
Restaurants	97
Takeaway	29
Nightclubs	24
Shops	29
Theatres	4
Social Clubs	4
Casinos/Bingo Halls	4

2.3.1 Alcohol production and distribution

Carlsberg UK Limited is listed as one of the top ten companies Leeds in terms of turnover, but the Carlsberg run brewery sited in Leeds is due to close in 2011 and therefore employment in the production of alcohol accounts for only a very small share of alcohol-related employment in Leeds. Employment related to the distribution of alcoholic drinks may account for a larger share of alcohol-related employment in Leeds, as Leeds is the third largest employment centre for wholesale distribution in England. In addition, ASDA Group Limited, the large supermarket chain, has its headquarters in Leeds and is one of the city's top 10 employers with over 100,000 employees locally. However, it is likely that the proportion of employees' effort related to distribution and retail of alcohol compared to other goods is fairly small.[9]

2.3.2 Alcohol retail

Over the last decade, there has been an expansion in the city's entertainment and cultural scene and a corresponding increase in the number of music venues, bars, clubs and restaurants within Leeds city centre. Since 1994, the number of city centre on-licensed premises and night clubs has more than doubled[4] and Leeds has one of the highest pub and club densities in the UK, having more than 40 pubs and clubs within a single output area (a level of geography that has an average of 400 residents).[12]

According to the Local Alcohol Profiles for England tool, Leeds ranks 97th out of 325 local authorities in England for the number of employees who work in pubs and bars.[6] Approximately 1.7% of Leeds employees work in pubs and bars, equal to an estimated 7,089 employees in pubs and bars across Leeds in 2008, and approximately 2,261 within the city centre. Employees in hotels and restaurants also have a role in the service of alcohol, and in

2008 there were around 25,300 people employed across Leeds in this sector.[11] Therefore, over 32,000 people were involved in the sale of alcohol in Leeds through pubs, clubs, restaurants and hotels as shown in Table 2. However, not all of these jobs are directly related to the consumption of alcohol. Assuming that 90-95% of jobs in bars and clubs, and 15-20% of jobs in restaurants and hotels are related to the consumption of alcohol,[9] then in 2008 between 10,175 and 11,795 jobs in Leeds were related to the sale of alcohol, representing 2-3% of all jobs in Leeds.

Labour productivity estimates[13] indicate an 'approximate Gross Value Added (GVA) per job' in current prices of £14,300 for jobs in bars, pubs and clubs and of £14,000 for jobs in restaurants.[iv] Applying these figures to the number of alcohol-related jobs in Leeds indicates that the GVA from jobs in alcohol retail was between £144.4 and £167.1 million in 2008, approximately 0.8-1% of the total Leeds' GVA in that year.

Table 2. Employment in alcohol retail sales in Leeds, 2008

	Total employees	Proportion related to alcohol	Alcohol-related employment	Approximate GVA per job
Bars and pubs	7,089	90-95%	6,380 – 6,735	£14,300
Hotels and restaurants	25,300	15-20%	3,795 – 5,060	£14,000
Total	**32,389**	-	**10,175 – 11,795**	-

Sources: NWPHO, Leeds City Council, Annual Business Inquiry

[iv] Jobs related to the service of alcohol in hotel were assumed to have similar labour productivity to jobs related to service of alcohol in restaurants.

3 METHODOLOGY

3.1 Introduction

The overall aim of the study was to identify and measure the economic and social costs of alcohol-related harm in Leeds using cost-of-illness (COI) methodology.[14] The following objectives were addressed in order to meet this aim:

- A review of the existing literature and approaches used in other COI studies, particularly those related to alcohol misuse;
- Identification of new research studies and data that enabled more robust estimates of the economic and social costs of alcohol-related harm to be derived; and
- Calculation of the economic and social costs of alcohol-related harm in Leeds.

3.2 Literature review

Literature searches were undertaken in Medline and the Health Management Information Consortium (HMIC) database to identify studies conducted in the UK and other countries that have examined the economic and social costs of alcohol misuse. The findings of the literature search are summarised in the following section of the report and reported in full in Appendix 1.

3.3 Identification of new research studies

Targeted literature searches were undertaken to identify research studies and data to enable more robust assumptions to be made about the proportion of resources that are alcohol-related. In addition to conducting searches of the academic literature, estimates used in previous COI studies were examined.

3.4 Calculation of the economic and social costs

Estimating the economic and social costs of alcohol-related harm involved: (1) identifying cost-generating components; and (2) attributing a monetary value to them. Costs included in the study were direct costs to health and social care services and the criminal justice system, and indirect costs in the form of production losses. The wider economic and social costs of alcohol-related harm were also considered including intangible or 'human' costs. Intangible costs are more difficult to measure than other types of costs, and consequently this study focused on the costs arising from alcohol-related premature mortality.

4 REVIEW OF THE ECONOMIC AND SOCIAL COSTS OF ALCOHOL-RELATED HARM

4.1 Estimation of the social and economic costs of alcohol use

A recent systematic review identified 22 studies that had examined the social costs of alcohol use.[15] The review found that the methodologies used for cost estimation varied considerably, and that a number of studies incorporated costs (e.g. transfer costs) that should not be included in cost estimation studies according to the *International guidelines*.[1] The full findings of a review of the literature on the economic and social costs of alcohol misuse undertaken for this project are presented in Appendix 1.

4.1.1 Development of international guidelines

Guidelines have been developed as part of an international initiative to develop sound methodologies and approaches for estimating the social and economic costs of substance use, including alcohol, tobacco and illicit drug use. The first set of guidelines was published in 2001,[16] with a second edition published in 2003.[1] In addition to developing a matrix of the major costs to be considered in cost estimation studies, these guidelines have included detailed discussion of the theoretical issues involved in cost estimation studies of substance use. The most recent set of guidelines[17] have been developed as a framework for the estimation of the avoidable costs of substance use. However, methods require further development as currently there are a number of difficulties in estimating avoidable proportions of the total social costs of substance use.

Box 2: Social costs associated with alcohol use

Direct

1. Consequences to health and welfare system
2. Crime, law enforcement and criminal justice
3. Road accidents
4. Fires
5. Environment
6. Research and prevention

Indirect

7. Productivity consequences in the workplace and the home

Intangible

8. Loss of life
9. Pain and suffering

Source: Single *et al.*[1]

4.1.2 Economic and social costs

Definitions of the social costs of alcohol use are shown in Table 3. The *International guidelines*[1,16] have identified the main categories, and suggested cost components, of the direct, indirect and intangible social costs to be included in cost estimates relating to alcohol use as shown in Box 2.

Table 3. Definition of social costs

Cost	Definition
Transfer costs	*Transfer costs* include tax payments, social payments, social allowances and insurance premiums. A recent review found that several transfer costs, including disability pensions, accident compensation, and social security payments were incorporated in some studies of the costs of alcohol use.[15] However, transfer payments are not considered social costs as they do not affect the amount of resources available in society and according to the *International guidelines*[1,16] should not be included in cost estimation studies. In addition, it is double counting to include both productivity losses and the costs of welfare payments in cost estimation studies. However, administrative costs associated with insurance and social welfare payments are counted as social costs. Property theft is also considered a transfer payment as it represents, according to the economic literature, the redistribution of assets from victims to the thieves and their customers. However, studies of the social costs of alcohol use have incorporated the costs of property theft by using the reduction in value of the stolen property in their cost estimations, which is considered a social cost.[15]
Private and external costs	Consumption of alcohol gives rise to both *internal* (*private*) and *external costs*. External costs are associated with the consumption of certain goods and services that fall on third parties (e.g. government funding for alcohol treatment) and private costs are those that affect the consumer (e.g. paying for private medical treatment). Although the total costs of alcohol use include both private and external costs, private costs are often not included in analyses of the social costs of alcohol use because they are considered to be offset by the benefits that a consumer gains from the consumption of alcohol.[1,16] However, costs to individuals and families were included in a recent, rapid review of the societal costs of potentially preventable illnesses, including alcohol misuse.[18] In the case of addictive substances, as Thavorncharoensap *et al.*[15] explain "addictive behaviour seems to violate the assumption of rational consumer behaviour since the addict may derive limited or no utility at all from drinking, yet will continue to do so anyway" (pg 9). The *International guidelines* recommend two approaches: (1) treat addictive substances as conventional goods and services assuming that dependent users are consuming rationally; or (2) estimate the proportion of excessive alcohol consumption and include this in the overall cost calculations.
Gross vs. net social costs	There has been much debate about the beneficial health effects of alcohol; for a full discussion of the evidence see Jones *et al.*[3] Estimation of the net costs of alcohol use takes into account the possible beneficial effects of alcohol consumption, where as estimation of gross costs, includes only costs associated with the negative effects of alcohol consumption. A review of studies of the social costs of alcohol use found that three studies, all from Australia, were based on net cost estimation, 17 studies were based on gross cost estimation, and two studies presented both approaches.[15]

Direct costs

Direct costs are those arising from expenditure as a consequence of alcohol consumption. A wide range of direct costs are associated with the treatment and prevention of alcohol use, including those within healthcare, social services and the criminal justice system.

Indirect costs

Indirect costs relate to the value of lost output due to reduced productivity caused by illness, disability or injury. Many COI studies use the human capital approach (HCA) to estimate indirect costs related to a disease or condition. The HCA is based on an individual's worth to society calculated on the basis of his or her present and future earnings, and it is the traditional method for calculating indirect costs.

Intangible costs

The measurement of productivity losses caused by illness, injury and death represents only a part of the total burden of an illness or disorder.[19] These additional costs may be termed 'human costs' and relate to the impact of illness, injury and death on the individual through pain and suffering, as well as on their friends and family. Although human costs are difficult to measure and express in monetary terms ('intangible'), the willingness to pay (WTP) approach can theoretically be used to determine such costs. However, in practice, the WTP method has been difficult to implement and has been used in very few COI studies.[19] Welfare losses have also been expressed as quality adjusted life years (QALYs), which are commonly used in economic evaluations of healthcare interventions. The QALY incorporates both the quality and quantity of the years of life that a person is expected to have.

4.2 Recent studies of the economic and social costs of alcohol

A total of 27 COI studies were identified that have examined the social and economic costs of alcohol use over the last 10 years. Ten studies examined the social and economic costs of alcohol in the UK, including in the whole of the UK,[20] England,[21-23] Scotland,[24-28] and sub-nationally in London[9] and North Somerset.[29] Eight studies examined the social and economic costs of alcohol use in European countries including Portugal,[30] France,[31,32] the Netherlands,[33] Sweden,[34,35] Germany[36] and Estonia,[37] and one study estimated costs at the European level.[10] Nine studies examined costs in the rest of the world, including the USA,[38-42] Australia[43,44] and Canada.[45] One study examined the economic costs attributable to alcohol at a global level.[46] The majority of studies considered costs from a societal viewpoint, that is, they considered a broad range of external costs related to alcohol misuse including those borne by health and social care services, the criminal justice system and in the workplace as shown in Table 4. Three studies[20,23,31] only considered healthcare expenditure related to alcohol use, but nine studies[9,10,27,28,32,34,35,38,39,43] considered a range of wider costs

related to alcohol use including the benefits of alcohol consumption, human costs (i.e. pain and suffering, quality of life), traffic accidents, research and prevention, and social welfare.

Table 4. Cost categories included

Reference	Cost categories					
	Healthcare	Social care	CJS	Workplace	Intangible	Other
United Kingdom						
UK 2005/06[20]	+	-	-	-	-	-
England 2000/01[21,22]	+	-	+	+	-	-
England 2006/07[23]	+	-	-	-	-	-
Scotland 2001/02[24,25]	+	+	+	+	-	-
Scotland 2002/03[26]	+	+	+	+	-	-
Scotland 2006/07[27]	+	+	+	+	+	-
Scotland 2007[28]	+	+	+	+	+	-
London 2000[9]	+	-	+	+	-	+[a]
North Somerset 2000/01[29]	+	-	+	+	-	-
Europe						
Portugal 1995[30]	+	-	+	+	-	-
France 1996[31]	+	-	-	-	-	-
France 1997[32]	+	-	+	+	-	+[c]
The Netherlands 2000[33]	+	+	+	+	-	-
Sweden 2002[34,35]	+	+	+	+	+	+[c]
Germany 2002[36]	+	-	-	+	-	-
Europe 2003[10]	+	-	+	+	+	+[b,c]
Estonia 2006[37]	+	-	+	+	-	-

Reference	Cost categories					
	Healthcare	Social care	CJS	Workplace	Intangible	Other
Other						
USA 1998[38]	+	-	+	+	-	+[f]
Australia 1998/99[43]	+	-	+	+	+	-
Australia 2004/05[44]	+	-	+	+	+	-
Canada 2002[45]	+	-	+	+	-	-
California 2005[39]	+	-	+	+	+	+[b,c]
Global 2007[46]	+	+	+	+	-	-

CJS – criminal justice system; [a] Benefits of alcohol consumption; [b] Traffic accidents; [c] Research and prevention; [d] Includes only the costs of 'excessive' alcohol consumption

A detailed analysis of the cost components included across the eight studies[9,21,24-29] that examined the social and economic costs of alcohol in Scotland and England is presented in Appendix 1. Table 5 summaries the estimated costs of alcohol-related harm across these studies.

Table 5. Estimated costs of alcohol-related harms in the UK (£ millions)

Component	Reference						
	England 2000/01[21, 22]	London 2000[9]	North Somerset 2000/01[29]	Scotland 2001/02[24,25]	Scotland 2002/03[26]	Scotland 2006/07[27]	Scotland 2007[28]
Healthcare	1,383 – 1,683	52	5	96	110.5	405	267.8
Social care	-	-	-	85.9	96.7	170	230.5
CJS	11,940	1,674[a]	27.3	267.9	276.7[b]	385[b]	727.1
Workplace	5,194 – 6,421	294	15.5	404.5	417.8	820	865.7
Human costs	-[c]	-	-[c]	216.7	223.8	-[c]	1,464.6
Total	**18,571-20,044**	**2,020**	**24**	**1,071**	**1,126**	**2,250**	**3,556**

CJS – criminal justice system; [a] Violent and 'other' crimes including robbery, burglary, theft and criminal damage; [b] Includes fire service expenditure; [c] Discussed but no cost estimates presented

5 THE COSTS OF HEALTHCARE

5.1 Introduction

This section presents estimates of the costs associated with healthcare resource use for conditions attributable to alcohol use.

5.2 GP and practice nurse consultations

The cost of GP and practice nurse consultations was calculated based on the methodology used to update the Cabinet Office estimates for 2008.[23] As there is no direct measure of the number of alcohol-related GP and practice nurse consultation nationally or locally then the following steps were taken.

Based on the findings of the Birmingham Untreated Heavy Drinkers (BUHD) project,[47] it was estimated that between 22% and 35% of GP consultations were alcohol-related among this cohort of heavy drinkers. Following the methods of the Department of Health report,[23] the arithmetic average of these figures, 28.5% was used in the calculation of alcohol-related consultations.

The General Lifestyle Survey (GLS) 2008 found that nationally, the number of GP consultations per year averaged four for males and five for females. The number of alcohol-related GP consultations per year was estimated by multiplying the average number of GP consultations per year by the number of high-risk drinkers in Leeds, and by the proportion of consultations that are alcohol-related (28.5%). For men, an estimated 25,205 GP consultations per year were alcohol-related and the corresponding figure for women was 18,847.

The estimate of alcohol-related consultations was also assumed to apply to practice nurse consultations and the number of alcohol-related practice nurse consultations was therefore calculated in the same way as the GP consultations. The GLS 2003 found that both men and women reported an average of two practice nurse consultations per year. Using similar calculations as previously described, for men an estimated 12,603 practice nurse consultations per year were alcohol-related, the corresponding figure for women was 7,539.

According the Personal Social Services Research Unit (PSSRU), the average 11 minute GP consultation costs £35 including qualification costs, direct care staff costs, salary oncosts and overheads in 2008/09.[48] The cost per consultation with a practice nurse was reported to be £11 including qualifications, salary oncosts and overheads. Applying these costs to the

number of alcohol-related GP and practice nurse consultations yields an annual cost of £1.5 million and £0.2 million, respectively.

- There were an estimated 44,052 alcohol-related GP consultations in Leeds in 2008/09, resulting in an estimated cost of £1.5 million.
- There were an estimated 20,141 alcohol-related practice nurse consultations in Leeds in 2008/09, resulting in an estimated cost of £0.2 million.

5.3 Other primary care usage

The Cabinet Office report[21] and subsequent update in 2008,[23] included costs for alcohol-related use of other primary care services including counselling, community psychiatric nurse visits, health visitors and usage of 'other services'. Data on the usage of these four categories of primary care services over three years were drawn from the BUHD project.[47] Table 6 presents the estimated annual usage of these services by high risk drinkers in Leeds.

Table 6. Estimated annual usage of other primary care services

Service	Estimated number of sessions per high risk drinker per year[a]		Estimated annual usage by high risk drinkers in Leeds	
	Males	Females	Males	Females
Counselling	0.20	0.93	4,422	12,300
Community Psychiatric Nurse	0.07	0.17	1,548	2,248
Health visitor	0.00	0.07	0	926
Other professionals	0.17	0.50	3,759	6,613

[a] Taken from Birmingham Untreated Heavy Drinkers project

The unit costs for each service element were taken from PSSRU 2009.[48] Community psychiatric nurse and health visitor visits were based on the costs of a 20 minute session, £18 and £32, respectively including qualification, staff oncosts and overheads. The unit cost of counselling, £42, were based on the costs of an hour of client contact and the cost of visits to 'other professionals', £1.58, were based on the costs presented in the 2008 report, uplifted to 2008/09 prices using the Hospital and Community Health Services (HCHS) pay and prices index. Applying these costs to the usage figures yielded a total annual cost of £0.8 million, as shown in Table 7.

Table 7. Estimated costs of annual usage of other primary care services

Service	Cost for usage of other primary care services		
	Males	Females	Total
Counselling	£185,722	£516,601	£702,323
Community Psychiatric Nurse	£27,342	£39,722	£67,064
Health visitor	£0	£29,626	£702,323
Other professionals	£5,932	£10,436	£16,368
Total	**£218,996**	**£596,385**	**£815,381**

5.4 Hospital inpatient visits and day hospital attendances

In order to estimate the number of hospital inpatient visits and day hospital attendances directly and indirectly attributable to alcohol, data were extracted for Leeds local authority from the Department of Health's NI39 data. This national indicator provides local measures of the rate of hospital admissions for alcohol-related harm derived from Hospital Episode Statistics (HES) data. The number of alcohol-related inpatient episodes and day patient episodes were extracted for 2008/09 for a range of alcohol-related conditions[v] as shown in Table 25 in Appendix 2.

There were a total of 4,997 alcohol-related inpatient episodes of care and 3,519 alcohol-related day patient episodes of care. According to the PSSRU 2009,[48] the national average cost per episode for an inpatient stay is £2,626 and the average cost per day case is £638. Applying these costs to the number of alcohol-related hospital inpatient visits and day hospital attendances yielded costs of £13.1 million and £2.2 million respectively.

- There were an estimated 4,997 alcohol-related hospital inpatient visits in Leeds in 2008/09, resulting in an estimated cost of £13.1 million.
- There were an estimated 3,519 alcohol-related day hospital attendances in Leeds in 2008/09, resulting in an estimated cost of £2.2 million.

5.5 Outpatient visits

The cost of outpatient visits was calculated based on the methodology used to update the Cabinet Office estimates for 2008.[23] As there is no direct measure of the number of alcohol-related outpatient visits nationally or locally then the following steps were taken.

[v] For further details on the risks of alcohol consumption and diseases and injury see Jones *et al*[3]

Findings from the BUHD project,[49] indicated that, compared to the general population, high risk drinkers were twice as likely to have used outpatient services in the past three months. Average outpatient attendances per year were reported to be an average of 1.08 for men and 1.16 for women in the GLS 2008. Based on the assumption that higher-risk drinkers use outpatient services twice as much as the general population, i.e. 2.16 and 2.32 attendances per year respectively, then the excess usage of 1.08 and 1.16 attendances per annum can be assumed to be alcohol-related attendances. Multiplying the excess usage figures by the number of high risk drinkers in Leeds yields an estimated 39,221 alcohol-related outpatient attendances per year (23,879 for men and 15,342 for women).

According to PSSRU 2009,[48] the average costs for attending adult outpatient services were £126 for 2008/09. Applying this figure to the number of alcohol-related outpatient attendances per year yields an annual cost of £4.9 million.

- There were an estimated 39,221 alcohol-related outpatient attendances in Leeds in 2008/09, resulting in an estimated cost of £4.9 million.

5.6 Accident and emergency attendances

An overall estimate of the number of alcohol-related attendances at accident and emergency (A&E) departments in Leeds is not available. However, data collected by the Safer Leeds Partnership shows that in 2009 over half of all patients who attended Leeds A&E departments complaining of assault had either consumed alcohol or believed that their assailant was drunk. In 2008/09, assaults accounted for approximately 12% of all A&E attendances in Leeds, indicating that alcohol was a factor related to attendance in approximately 7% of all A&E attendances.

Literature-based estimates of the number of A&E attendances which are alcohol-related vary, but the estimate based on the Leeds data appears to lie at the lower end of these. Studies conducted in Liverpool[50] and Birmingham[51] have estimated that between 12% and 3% of all A&E attendances, respectively, are alcohol-related. However a study conducted in Inverness,[52] which measured alcohol concentrations in saliva among attendees found that 22-25% of attendances were alcohol-related. The Cabinet Office report and recent update[21,23] used an estimate of 35% based on a MORI survey of A&E staff, and the recent Scotland report[28] used a range of estimates between 2% and 40%.

Estimates of the number of alcohol-related attendances in A&E are therefore presented as low, mid and high estimates based on 2.9%, 7% and 35% of A&E attendances being alcohol-related. These proportions are applied to the number of A&E attendance within Leeds

Primary Care Trust (PCT) in 2008/09 (n=35,030). According to the PSSRU 2009,[48] costs for A&E services for 2008/09 ranged from £126 to £93, depending on whether treatment led to admittance. Taking the average of these costs gave an estimated cost of £110 per A&E attendance. Applying this cost to the estimated number of alcohol-related attendances resulted in costs between £0.1 million and £1.3 million, as shown in Table 8.

Table 8. Estimated costs of alcohol-related A&E attendance

Proportion of A&E attendances that are alcohol-related	Number of alcohol-related attendances	Cost of A&E attendances
2.9%	1,016	£111,238
7%	2,452	£268,505
35%	12,261	£1,342,525

- There were an estimated 1,016 to 12,261 alcohol-related A&E attendances in Leeds in 2008/09, resulting in estimated costs between £0.1 and £1.3 million.

5.7 Ambulance service

Ambulance services in Leeds are provided by the Yorkshire Ambulance Service (YAS). In 2008/09 there were 451,060 emergency and urgent patient journeys across the entire region serviced by the YAS. Assuming that 16% of the estimated population of Yorkshire and the Humber reside in Leeds (based on mid-year population estimates for 2008) then an estimated 71,740 patient journeys occurred within the Leeds area.

As with the calculations presented for A&E attendances, estimates of the number of alcohol-related ambulance journeys are presented as low, mid and high estimates based on 2.9%, 7% and 35% of journeys attendances being alcohol-related. No national average cost for emergency ambulance journeys was reported by the PSSRU for 2008/09. Therefore the average cost was calculated from the average of the 2007 prices for the average cost per patient journey of paramedic unit or emergency ambulance journey (£344 and £263, respectively), uplifted to 2008/09 prices to give an average cost of £318. Applying this cost yielded estimates between £0.7 million and £8.0 million, as shown in Table 9.

Table 9. Estimated costs of alcohol-related emergency ambulance journeys

Proportion of A&E attendances that are alcohol-related	Number of alcohol-related attendances	Cost of A&E attendances
2.9%	2,080	£661,006
7%	5,022	£1,595,531
35%	25,109	£7,977,653

- There were an estimated 2,080 to 5,022 alcohol-related emergency and urgent ambulance journeys in Leeds in 2008/09, resulting in estimated costs between £0.7 and £8 million.

5.8 Alcohol dependency prescribed drugs

Drugs used in the treatment of alcohol dependence include disulfiram, long acting bendiazepines, clomethiazole and acamprosate.[vi] Following the methodology presented in the Cabinet Office report[21] and subsequent update,[23] the cost of prescriptions for these drugs were identified from the Prescription Cost Analysis for 2008/09.

In 2008/09, the net ingredient cost (NIC) to Leeds PCT for prescribing drugs used in substance dependence was £2.3 million. This cost was not broken down according to the individual substances prescribed but based on national data the assumption was made that acamprosate and disulfiram accounted for 1.5% and 0.9% of the items dispensed within this category, resulting in a total annual cost of £56,234 in 2008/09 prices.

Although long-acting benzodiazepines, such as chlordiazepoxide, and clomethiazole are also used for alcohol withdrawal as they are indicated for use in the treatment of other conditions it was not possible to determine the costs attributable to alcohol dependence. The NIC to Leeds PCT in 2008/09 for prescribing hypnotics and anxiolytics was £855,786.

- The costs of prescribing drugs for alcohol dependency in Leeds in 2008/09 were estimated at £56,234.

[vi] British National Formulary. 56 ed. London: British Medical Association and Royal Pharmaceutical Society of Great Britain; 2008

5.9 Alcohol treatment services

A wide range of treatment services are provided for alcohol users in Leeds by public sector, private sector and voluntary organisations. Services range from brief interventions (within tier 1 and 2 treatment settings) to specialist structured care and inpatient detoxification (tier 3 and 4, as defined in Models of Care[53]). Funding is also directed through a range of agencies as detailed below and in Table 10.

Community alcohol services in Leeds are delivered through a number of different treatment providers receiving funding through NHS Leeds, the local authority Adult Social Care department, Leeds Supporting People and the Safer Leeds Partnership. In addition, the Leeds Addiction Unit is funded by NHS Leeds to deliver structured intervention and detoxification for patients with complex needs.

There are three main charities in Leeds who receive funding through various streams to deliver a variety of interventions. Addiction Dependency Solutions is funded through Local the local authority Adult Social Care department and NHS Leeds to deliver community alcohol interventions and through NHS Leeds to provide brief interventions in a primary care setting. The service is also funded through the Safer Leeds Partnership to deliver treatment intervention to individuals accessing the Alcohol Treatment Requirement scheme. A scheme that provides probation supervision and alcohol treatment to offenders who have committed an alcohol related offence. St Anne's Community Services provides specialist support for alcohol users, through the provision detoxification and rehabilitation beds, and a floating support service for alcohol detoxification, rehabilitation and aftercare. The service receives funding from NHS Leeds to deliver the inpatient detoxification, the local authority Adult Social Care department to provide a rehabilitation service and from Leeds Supporting People to deliver aftercare through the floating support service. St Georges Crypt, a Christian Charity, provides care and support for homeless, vulnerable and disadvantaged people and offers two treatment services in Leeds which are both funded by Leeds Supporting People. Regent House, a Wet House is a hostel for men and permits residents to drink within the confines of the hostel and is the only project of its kind in Leeds. A second wet hostel in the city, Carr Beck, provides accommodation and support services for female dependent drinkers through Leeds Housing Concern. The Faith Lodge service, a dry hostel, provides a structured programme of skills training and confidence building. The hostel provides 14 beds for residents who have made a conscious decision to stay off alcohol and/or drugs permanently.

Expenditure on alcohol treatment services in Leeds also includes spending on out of area detoxification and rehabilitation services through NHS Leeds and the Adult Social Care budget, and alcohol arrest referral. The Alcohol Arrest Referral Service in Leeds is provided

by Crime Reduction Initiatives with funding support from the Safer Leeds Partnership. The service works in custody and the community supporting clients to access a range of services including; prescribing, housing, education training and employment and primary health care.

Table 10. Expenditure on alcohol treatment services in Leeds, 2008/09

Service	Agency or agencies providing service	Commissioned by	Annual cost
Community alcohol services	Addiction Dependency Solutions	NHS Leeds	£96,200
Community alcohol services	Addiction Dependency Solutions	Adult Social Care	£71,728
Community detoxification	Leeds Addiction Unit	NHS Leeds	£994,046
Primary Care Brief Intervention	Addiction Dependency Solutions	NHS Leeds	£140,000
Residential detoxification	St Anne's Community Services	NHS Leeds	£237,211
Residential rehabilitation	St Anne's Community Services	Adult Social Care	£357,619
Floating Housing Support	St Anne's Community Services	Leeds Supporting People	£31,180
Wet House (men)	St George's Crypt	Leeds Supporting People	£85,347
Wet House (women)	Carr Beck/Leeds Housing Concern	Leeds Supporting People	£109,003
Dry house	Faith Lodge	Leeds Supporting People	£76,875
Out of area detoxification	Various	NHS Leeds	£150,000*
Out of area rehabilitation	Various	Adult Social Care	Unknown
Alcohol treatment requirement	Addiction Dependency Solutions	European Union/Safer Leeds Partnership	Unknown
Alcohol arrest referral	Crime Reduction Initiatives	European Union/Safer Leeds Partnership	Unknown

*majority of expenditure on drug treatment services

Source: NHS Leeds

As shown in Table 10, expenditure on alcohol treatment services in Leeds in 2008/09 was £1.8 million not including expenditure through the Adult Social Care service budget, which is considered in Section 6.2. Including these Adult Social Care expenditure, and assuming that spending on out of area detoxification was half the amount reported, expenditure on alcohol treatment services in Leeds in 2008/09 was £2.2 million.

- The costs of providing alcohol treatment services in Leeds in 2008/09 were estimated at £1.8 million.

6 THE COSTS OF SOCIAL CARE

6.1 Children's and families services

Forrester and Donald[54,55] found that substance misuse was a common issue within child care social work. Based on a study of case files across four London boroughs over a 1-year period,[54] they found that parental substance misuse emerged as a major factor in 34% of cases; 14% of families were affected solely by alcohol misuse and 9% of families were affected by both drug and alcohol problems. Currently, no national study has been undertaken on the extent and nature of parental substance misuse in social work cases.

According to the Personal Social Services Expenditure and Units Costs published for England, gross total expenditure by Leeds City Council on Children's and Families services was £109,056,000 in 2007/08. Estimates for gross total expenditure on child care social work associated with parental alcohol misuse are presented in Table 11, according to different assumptions about the proportion of child care social work cases that are alcohol-related. Based on these assumptions, alcohol-related expenditure on children's and families services in Leeds in 2007/08 was between £15.3 million and £37.1 million. Using the GDP deflator series, the costs were uplifted to 2008/09, yielding estimated costs between £15.7 million and £38.0 million, with a mid-point estimate of £26.8 million.

Table 11. Estimated alcohol-related expenditure on children's and families services in Leeds

Proportion of child social care that is alcohol-related	Costs	
	2007/08	uplifted to 2008/09
Any substance misuse = 34%	£37,079,040	£38,011,461
Alcohol misuse or drug and alcohol misuse = 23%	£25,082,880	£25,713,635
Alcohol misuse only =14%	£15,267,840	£15,651,778

- The costs of child social work associated with parental alcohol misuse in Leeds in 2008/09 were estimated to be between £15.7 million and £38.0 million, with a mid-point estimate of £26.8 million.

6.2 Adult social care

According to the Personal Social Services Expenditure and Units Costs for England, gross total expenditure by Leeds City Council on adult services for substance abuse was £488,000 in 2007/08. It is not clear what proportion of this expenditure was spent in relation to alcohol misuse. Assuming that between 25% and 50% of expenditure was related to alcohol misuse, alcohol-related expenditure on adult social care services in Leeds in 2007/08 was between £122,000 and £244,000, respectively. Using the GDP deflator series, the costs were uplifted to 2008/09, yielding estimates between £125,068 and £250,136, with a mid-point estimate of £187,602.

- The costs of adult social care services related to alcohol misuse in Leeds in 2008/09 were estimated to be between £125,068 and £250,136, with a mid-point estimate of £187,602.

7 CRIMINAL JUSTICE SYSTEM COSTS

7.1 Alcohol-specific crimes

There are several low-level offences that are alcohol-specific. A recent update of the costs of alcohol-related crime found that the total cost attributable to alcohol-specific offences in England, including driving offences that do not result in death, was £208 million.[56]

The cost of an arrest was estimated at £165.15, based on an estimate of 5 hours for a drunk and disorderly arrest and for police time of £33.03 per hour. Court costs associated with alcohol-related crime were estimated based on the Office of Criminal Justice Reform's marginal unit costs and the costs (to the police, the Crown Prosecution Service, Legal Aid and Her Majesty's Courts Service) of a summary non-motoring offence in which the defendant pleaded guilty was assumed to be £407. The authors report that it was not possible to put a cost on the issuing of a caution, over and above the cost of first arresting the offender.

Proceedings, cautions and sentence disposal data were not available at a sufficient level for estimates of the volumes of alcohol-specific crime within Leeds to be calculated. The national figure was therefore adjusted to the Leeds population, assuming that 1.5% of the population of England reside within the Leeds area. Based on these calculations, the estimated cost attributable to alcohol-specific offences in the Leeds area is in the region of £3.0 million.

For a range of offences, including alcohol-related sale, purchase and consumption offences, the police may issue penalty notices for disorder (PNDs). The recent update of the costs alcohol-related crime estimated that based on 1.5 hours of police time at a cost of £33.03 per hour and a payment rate of 52%, the net cost of issuing PNDs for alcohol-specific offences was approximately £800,000.[56] Applying these estimates to the 1,787 PNDs issued by West Yorkshire Police in 2008, resulted in costs attributable to alcohol-specific PNDs of £42,498.

- The cost attributable to alcohol-specific offences in Leeds in 2008/09 was in the region of £3.0 million.

7.2 Alcohol-related crimes

It is difficult to accurately measure the proportion of crimes and offences that are alcohol-related, but studies have shown an association between alcohol misuse and disorderly and offending behaviour. Among young people, a Home Office study [57] demonstrated that there was an association between binge drinking and involvement in disorderly and criminal behaviour and based on analysis of the 2003 Offending, Crime and Justice Survey (OCJS), Matthews and Richardson[58] found that those who frequently drink to excess were more likely to report offending in the previous year than those who reported drinking less frequently.

Levels of recorded crime aggregated by offence group in Leeds LA in 2008/09 were extracted from Home Office statistics. In order to estimate the number of offences within these categories, national recorded crime statistics were used to apportion the aggregated number of offences. For example, there were 1,407 recorded robberies in Leeds LA in 2008/09 of which, according to national data, 88% were robbery from an individual and 12% were robbery from a business, resulting in 1,243 and 164 offences, respectively. These calculations were repeated for 20 alcohol-related offences. To take into account underreporting of crimes, a multiplier was applied to each recorded offence to better estimate actual volumes of crime. The multipliers were taken from two studies by Dubourg *et al*,[59] and Brand and Price,[60] respectively. The proportion of crimes and offences that were alcohol-related were taken from the 2005 OCJS.[61] These figures were based on the proportion of incidents committed by offenders aged 10-25 years old according to whether they had taken alcohol, or drugs and alcohol at the time of the incident. The proportion of alcohol-related crimes and offences were applied to the estimated number of offences in Leeds LA in 2008/09 across 20 offences, yielding the estimates shown in Table 12. Overall, there were an estimated 85,973 alcohol-related crimes and offences in Leeds LA in 2008/09, with criminal damage and theft from shops comprising the majority of the offences committed.

Table 12. Estimated number of alcohol-related crimes and offences

Type of offence	Recorded crime 2008/09	Multiplier	Estimated total offences	Proportion of alcohol-related crimes	Estimated alcohol-related offences
Burglary in business	6,368	3.7	23,562	7%	1,649
Burglary in a dwelling	9,248	2.2	20,346	7%	1,424
Criminal damage	16,586	4.3	71,320	37%	26,388
Theft of a vehicle	2,732	1.2	3,278	34%	1,115
Theft from a vehicle	7,775	2.8	21,770	34%	7,402
Aggravated vehicle taking	188	1.2	226	34%	77
Theft from a person	1,490	4.6	6,856	7%	480
Theft of a pedal cycle	1,732	3.6	6,234	7%	436
Theft from shops	5,331	100.0	533,147	7%	37,320
Other theft	7,851	2.7	21,199	7%	1,484
Robbery from individual	1,243	3.7	4,599	7%	322
Robbery from business	164	3.7	607	7%	43
Sexual offences	715	5.2	3,718	21%	781
Homicide	9	1.0	9	21%	2
Causing death by dangerous driving	0	1.0	0	100%	0
Assault on a constable	240	7.7	1,849	19%	351
Assault without injury	2,722	7.7	20,956	19%	3,982
More serious wounding	323	1.8	582	26%	151
Less serious wounding	5,468	1.8	9,842	26%	2,559
Violent disorder	20	1.8	36	21%	8

Leeds LA, 2008/09

Two Home Office studies estimated the economic and social costs of crime in 2000 and 2005, respectively.[59,60] Updated estimates of the unit costs of crime for each of the 20 offences were taken from Dubourg *et al,*[59] with the exception of crimes in the commercial and public sector which were taken from Brand and Price[60] as these figures were not updated in the more recent study. Costs were divided into three categories, estimating: (1) costs in anticipation of crime; (2) costs as a consequence of crime; and (3) criminal justice system costs. Unit costs were uplifted to 2008/09 using GDP deflators published by the HM Treasury. Applying these cost estimates to the estimated number of alcohol-related crimes and offences yielded total costs of £124.5 million, as shown in Table 13.

- There were an estimated 85,973 alcohol-related crimes and offences in Leeds LA in 2008/09, yielding total costs of £124.5 million.

Table 13. Estimated cost of alcohol-related crimes and offences in Leeds LA, 2008/09

Type of offence	Estimated total costs of alcohol-related crime			
	In anticipation	As a consequence	Criminal Justice System	Total
Burglary in business	£1,958,338	£2,556,146	£1,010,090	£5,524,574
Burglary in a dwelling	£644,453	£2,804,503	£1,841,062	£5,290,018
Criminal damage	£1,470,102	£20,761,437	£3,780,262	£26,011,800
Theft of a vehicle	£1,160,849	£3,829,788	£252,193	£5,242,831
Theft from a vehicle	£1,396,963	£5,402,712	£420,772	£7,220,447
Aggravated vehicle taking	£80,055	£264,112	£17,392	£361,559
Theft from a person	£60,563	£282,082	£118,398	£461,043
Theft of a pedal cycle	£16,372	£149,330	£149,330	£315,033
Theft from shops	£1,399,353	£2,332,255	£932,902	£4,664,511
Other theft	£55,675	£504,372	£507,827	£1,067,875
Robbery from individual	£7,686	£1,705,009	£951,954	£2,664,649
Robbery from business	£69,058	£120,054	£74,370	£263,482
Sexual offences	£7,102	£24,972,887	£2,927,648	£27,907,636

Type of offence	Estimated total costs of alcohol-related crime			
	In anticipation	As a consequence	Criminal Justice System	Total
Homicide	£816	£2,869,303	£314,879	£3,184,999
Causing death by dangerous driving	£0	£0	£0	£0
Assault on a constable	£0	£473,738	£101,858	£575,595
Assault without injury	£0	£5,369,008	£1,154,382	£6,523,390
More serious wounding	£344	£1,216,305	£2,466,133	£3,682,782
Less serious wounding	£5,818	£20,582,862	£2,845,235	£23,433,916
Violent disorder	£17	£73,227	£16,657	£89,901
Total	**£8,333,564**	**£96,269,131**	**£19,883,343**	**£124,486,039**

8 THE COSTS OF LOST PRODUCTIVITY

8.1 Presenteeism

Costs for alcohol-related reduced productivity in the workplace (or presenteeism) were not calculated in the Cabinet Office report,[21] but were included in the most recent estimate of the economic and social costs of alcohol in Scotland.[28] Calculation of these costs was based on a survey of employees undertaken by reed.co.uk, which found that an average of 0.68 days[vii] annually were lost due to alcohol-related reduced productivity in the workplace.

Assuming that full-time workers lose 0.68 days per year and part-time workers lose 0.34 days, a total of 218,857 days were lost in Leeds in 2008/09 due to alcohol-related reduced productivity in the workplace. Following the methodology presented in the study of the economic and social costs of alcohol in Scotland in 2007,[28] the median gross weekly earnings of full-time employees in Leeds in 2009 were uplifted by 10% and 20% to reflect the estimated additional costs incurred by employers, such as National Insurance and other oncosts. The median gross costs per day for employers in Leeds were £116.85 (with 10% uplift) and £127.48 (with 20% uplift). As shown in Table 14, the cost of the lost output due to alcohol-related presenteeism was between £25.6 million and £27.9 million, with a mid-point value of £26.7 million.

Table 14. Costs of alcohol-related presenteeism in 2008/09

	Days lost due to presenteeism	With 10% uplift	With 20% uplift
Assuming all employees lose 0.68 days per year	257,176	£30,051,684	£32,783,656
Assuming full-time workers lose 0.68 days per year and part-time workers lose 0.34 days per year	218,857	£25,573,983	£27,898,891

- An estimated 218,857 days were lost due to alcohol-related reduced productivity in Leeds in 2008/09, with associated costs between £25.6 and £27.9 million, with a mid-point value of £26.7 million.

[vii] Respondents reported turning up to work with a hangover on average two and a half days a year and reported themselves to be 27% less efficient on these days.

8.2 Absenteeism

The costs of alcohol-related absenteeism were also calculated based on the methodology presented in the study of the economic and social costs of alcohol in Scotland in 2007.[28] Using estimates from the Cabinet Office report,[21] between 6% and 15% of working days lost to sickness were attributed to alcohol-related sickness.

In 2008, the CBI/AXA Absence Survey found that the average days of sick leave in Yorkshire and the Humber was approximately 8.9 days. Based on the total number of person in employment in Leeds (n=378,200), and assuming that part-time workers have an average of 4.45 days of sick leave, there were nearly 3 million (2,864,449) days of sick leave in Leeds in 2008/09. Table 15 summarises the costs associated with days of sick leave according to whether 6% or 15% of the proportion of days of sick leave are assumed to be alcohol-related. The annual cost to Leeds economy in 2008/09 was estimated to be between £21.4 million and £52.5 million, with a mid-point value of £36.7 million.

Table 15. Costs of alcohol-related absenteeism in Leeds, 2008/09

	Total days of absence	Number of days of alcohol-related sick leave		Costs due to alcohol-related sick leave*	
		6%	15%	6%	15%
Full-time employees	2,362,918	141,775	354,438	£17,319,822	£43,299,556
Part-time employees	501,531	30,092	75,230	£3,676,145	£9,190,362
All employees	**2,864,449**	**171,867**	**429,667**	**£20,995,967**	**£52,489,917**

*Costs presented are the mid-point values based on the median gross cost per day uplifted by 10% or 20%

- Between 171,867 and 429,667 days were lost due to alcohol-related absenteeism in Leeds in 2008/09 with associated costs between £21.0 million and £52.5 million, with a mid-point value of £36.7 million.

8.3 Unemployment

Estimation of the costs due to alcohol-related employment followed the methods presented in the Cabinet Office report.[21] The methodology presented in this report was based on a study conducted by MacDonald and Shields,[62] who found that being a problem drinker led to a reduction in the probability of working by between 7% and 31%. Using these findings the Cabinet Office report[21] estimated that male heavy drinkers spent an average 11.4 days

per year unemployed with a corresponding figure of 8.1 days per year unemployed for female heavy drinkers. The number of economically active, alcohol dependent males and females in Leeds was calculated by applying national estimates of the proportion of heavy drinkers in the population (see Box 1) to the number of working age adults in Leeds in 2008 (aged 16-64M/59F; n=516,600) and multiplying by the economic activity rate. Based on these calculations there were an estimated 15,031 economically active, alcohol dependent males and 7,462 economically active, alcohol dependent females in Leeds in 2008.

Applying the estimates of 11.4 days per year unemployed for males and 8.1 days per year unemployed for females resulted in a total of 231,796 days per year of unemployment due to alcohol dependence in Leeds in 2008/09 (171,350 days of unemployment for male heavy drinkers and 60,445 days of unemployment for female heavy drinkers). The estimated cost to the Leeds economy in 2008/09 of unemployment due to alcohol dependence was £25.6 million.

- A total of 231,796 days were lost due to alcohol-related unemployment in Leeds in 2008/09 with associated costs of £25.6 million.

8.4 Premature mortality

The number of potential years of working life lost directly and indirectly due to alcohol misuse were calculated. The number of alcohol-related deaths in 2007 (latest data available) were calculated and are presented in 5-year age bands in Table 16.

Table 16. Number of alcohol-related deaths in Leeds, 2007

	Age (years)										
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	Total
Males	1	8	2	8	11	15	11	12	22	16	106
Females	0	1	1	0	0	5	7	6	7	7	34
Total	1	9	3	8	11	20	18	18	29	23	140

Source: NWPHO

The years of potential working life lost were calculated by assuming that all of the deaths occurred at the mid-point within each age band and that men and women both retire at the age of 65 years. Overall, there were a total of 2,440 years of potential working years of life lost in Leeds in 2007; 1,963 among males and 477 among females. These figures were

adjusted to reflect the employment rate in 2008 of 73.1% among males and 69.5% among females. The value of this loss of potential working life was estimated by multiplying the years of employed life lost by the average earnings for male and female employees in Leeds in 2009, adjusted for the proportion of the workforce in full-time and part-time employment. Future earnings were discounted at 3.5% and a productivity growth rate of 2% per annum was assumed.[22] The estimated cost to the Leeds economy in 2008/09 was £29.2 million, comprising costs of £24.2 million and £5.1 million arising from alcohol-related deaths among males and females, respectively.

- A total of 2,440 years of potential working years of life were lost in Leeds in 2007 with associated costs of £29.2 million.

9 WIDER SOCIAL & ECONOMIC COSTS

9.1 Fire service attendance at alcohol-related house fires and RTAs

Expenditure on fire fighting and rescue operations in West Yorkshire was £69.1 million in 2008/09.[63] Assuming that 34% of the population of West Yorkshire reside in Leeds, then an estimated £23.5 million was spent on delivering fire fighting and rescue operations in the Leeds area. The following calculations considered the costs that the fire services incur due to alcohol-related house fires and road traffic accidents.

A report by the Department for Communities and Local Government found that substance use, including legal and illegal substance use, was common at the time of fires. In around 33% of the fire cases investigated, the victim was impaired by alcohol. Alcohol was reported to have been a direct cause of fire in 25% of fires and as a factor affecting the response to the fire in 26% of fires. In 2008/09 there were 84 primary (building) fires in West Yorkshire in which the occupier was impaired or possibly impaired by alcohol or drugs; 34 of these were in Leeds District.[viii] Assuming that the average cost of fire service attendance at a domestic fire was £27,544 per house fire resulted in estimated costs of £936,496.

There were 983 road traffic accidents (RTAs) attended by West Yorkshire Fire and Rescue Services in 2009/10; 3% of incidents attended by the service within that year.[64] In Great Britain in 2008, an estimated 6% of all road casualties occurred when someone was driving whilst over the legal alcohol limit.[65] Assuming that 6% of all RTAs attended were alcohol-related and that 3% of fire service expenditure on fire fighting and rescue operations was spent on attending RTAs, then the estimated cost in 2008/09 was £124,454. Assuming that 34% of the population of West Yorkshire resides in Leeds then the approximate costs for attending alcohol-related RTAs in Leeds in 2008/09 was in the region of £42,000.

- Costs associated with fire service attendance at alcohol-related house fires and RTAs were estimated at £1.0 million.

9.2 Lost value of non-paid work and activities before retirement

The value of the lost output among non-participants in the workforce was calculated based on the methods presented in the study of the economic and social costs of alcohol in Scotland in 2007.[28] These calculations assumed that non-participants in the workforce would have undertaken a variety of unpaid work and activities and the methods were

[viii] Personal communication from West Yorkshire Fire and Rescue Service.

similar to those used to calculate the value of lost productivity in the workforce in Section 8.4. These data indicated that 27% of men and 31% of women in the Leeds area were not in employment. To place a value on the time spent on non-work activities, the Scottish report[28] used the wage of the occupational group with the lowest median weekly earnings. As this data was not available for Leeds, the weekly earnings of the bottom 10% of earners in 2009, of £279.40 for males and £267.40 for females, was used in the calculations presented here. Converting these to annual earnings resulted in proxy annualised earnings of £14,569 for males and £13,943 for females.

Applying these annual values to the premature years of life lost among the non-participants in the workforce, discounting future earnings at 3.5% and assuming a productivity growth rate of 2% per annum,[22] resulted in costs to the Leeds economy of £8.1 million. These costs comprised £6.4 million and £1.7 million arising from alcohol-related deaths among males and females, respectively.

- Costs associated with the lost output of non-participants in the workforce were estimated at £8.1 million.

9.3 Lost value of non-paid work and activities after retirement

The value of non-paid work undertaken between retirement and the age of 75 was also calculated. Between the ages of 65 to 74 years there were 37 alcohol-related deaths in Leeds in 2007. Based on the expected life span, a total of 559 years of life were lost prematurely after retirement. Using the same methodology as the study of the economic and social costs of alcohol in Scotland in 2007,[28] the value of the non-paid activities undertaken was calculated as the annualised half of the weekly earnings of the bottom 10% of earners in Leeds in 2009 of £270.30, giving a value of £7,047 per year for males and females. Applying this value to the premature years of life lost and discounting by 3.5%, yielded total costs associated with non-paid work and activities after retirement up to the age of 75 years of £3.0 million (£1.8 million for males and £1.2 million for females).

9.4 Intangible costs

The intangible or human costs associated with alcohol-related morbidity and mortality were calculated based on the methods presented in the study of the economic and social costs of alcohol in Scotland in 2007.[28] These study identified two values of a year of life: (1) £30,000 based on the upper threshold QALY used by the National Institute for Health and Clinical Excellence; and (2) £50,000 based on the views of the Department of Health. As in the

Scotland study, these values were used to estimate the human costs associated with premature mortality directly and indirectly due to alcohol misuse.

Years of life lost up to the age of 75 years were calculated based on the number of alcohol-related deaths in Leeds in 2007, within 5-year age bands. A total of 5,235 years of life were lost due to premature mortality in Leeds in 2007. As shown in Table 17, applying a value of £30,000 to every year of life lost due to alcohol-related premature mortality in Leeds in 2007 yielded total costs of £92.3 million (discounted at 3.5%). For a value of £50,000 per life year the associated costs were £153.9 million (discounted at 3.5%). The midpoint of these values was £123.1 million.

Table 17. Intangible costs of premature mortality

	Years of life lost	Costs of premature mortality	
		£30,000 per life year	£50,000 per life year
Males	3,894	£67,898,626	£113,164,377
Females	1,341	£24,434,469	£40,724,114
Total	5,235	£92,333,095	£153,888,492

- A total of 5,235 years of life were lost due to premature mortality in Leeds yielding intangible or human costs between £92.3 million and £153.9 million, with a midpoint of £123.1 million.

9.5 School failure and reduced educational attainment

Alcohol use among young people is associated with school failure and reduced educational attainment. In the 2007 ESPAD report, 13% of young people aged 15-16 years old reported performing poorly at school or work because of their alcohol use. A recent study based on data from the UK National Child Development Study[66] found that male heavy drinking in adolescence had a negative effect on the receipt of postsecondary qualifications by age 42. Males from working-class families were most affected by heavy alcohol use in these analyses, but heavy alcohol use had little effect on female educational attainment. Analyses of data from the US National Longitudinal Survey of Youth 1979, has shown that late graduation as a consequence of binge drinking during the senior year of high school is associated with lower labour earnings.[67,68]

Although there is evidence for an association between alcohol use among young people and educational attainment, and the subsequent effects of this on earning potential, there are

currently no methods on the basis of which it would be possible to estimate the related costs to society.

9.6 Alcohol-related litter

Alcohol-related litter represents a serious environmental health and community safety issue in many communities.[69] For example, a study of drug and alcohol-related litter in a social housing community in Scotland found little evidence of drug related litter, but identified more than 1,400 items of alcohol-related litter, much of which was glass (including intact and broken glass).[70] Of the quarter of respondents to the 2008/09 British Crime Survey[71] who thought that people being drunk or rowdy in public places was a very or fairly big problem in their area, two-thirds reported experiencing cans and bottles left on the streets or thrown into gardens, and as part of a local campaign to tackle litter in Stockport, alcohol-related litter was identified on 62% of paths.[72]

Although there is evidence to suggest that alcohol-related litter can be a significant issue in many communities, there is currently insufficient data on the basis of which it would be possible to estimate the costs associated with alcohol-related litter clean-up.

10 DISCUSSION

Alcohol misuse imposes a considerable burden on the Leeds economy, costing an estimated £438.0 million in 2008/09. Of the total costs, 13% were due to expenditure on health and social care services, 29% of costs were due to expenditure on crime and within the criminal justice system, 27% were due to lost productivity and 31% were due to the wider social costs of alcohol misuse.

Alcohol plays an important role in society and makes a contribution to the Leeds economy, both directly and indirectly, through employment in industries related to alcohol. The contribution that alcohol makes to the Leeds economy is mainly through employment in pubs, bars and restaurants, and the expansion in the city's nightlife scene has been central to the development of the city centre over the last decade. The Leeds economy also derives a small benefit from employment in industries related to the production, distribution and retail of alcoholic drinks. The social benefits of alcohol lie in its consumption and in the Yorkshire and Humber region, three quarters of men and almost three fifths of women report drinking on a weekly basis. Households in the region also spend more per week than the national average on alcoholic drinks, with households in Leeds alone spending an estimated £4.5 million on alcoholic drinks per year. However, as well as bringing benefits, alcohol is associated with a range of harms. For example, the impact of alcohol on health shortens the life expectancy of male and female residents in Leeds by an average of 11 and 5 months, respectively, and resulted in approximately 12,800 alcohol-related hospital admissions in 2008/09. There is also an association between alcohol use and offending, and excessive alcohol consumption also affects productivity in the workplace, for example, by increasing the likelihood of employees being absent from work.

Cost-of-illness methods were used to estimate the economic and social costs of alcohol-related harm in Leeds, an approach which was been widely used in other costing studies to estimate the burden of alcohol misuse to society. These methods are not a form of economic evaluation but they do provide a clear means of presenting and understanding the economic costs attributable to alcohol use. The impact of alcohol-related harm in Leeds was examined by estimating: alcohol-related expenditure on health and social care and within the criminal justice system; the wider costs including productivity losses in the workplace; and the human costs representing the impact of illness, injury and death on the individual through pain and suffering, as well as on their friends and family.

The total annual burden of alcohol to the Leeds economy was estimated to be £438.0 million in 2008/09. As shown in the Table 18 below, the wider social costs of alcohol misuse

(including human costs) and lost productivity together comprised nearly three fifths of the total costs to the Leeds economy. Health and social care costs comprised the smallest amount of the costs attributable to alcohol use.

Table 18. Annual costs of alcohol misuse to the Leeds economy, 2008/09

Resource	Annual cost (£ million)
Health and social care	57.6
Criminal justice system	127.5
Workplace and productivity	117.7
Wider social costs	135.2
Total	**438.0**

It should be noted that there are limitations to the estimates derived. Some costs associated with alcohol misuse have not been calculated; including the costs associated with cleaning up alcohol-related litter and the costs associated with school failure and reduced educational attainment. The costs calculated were often based on assumptions drawn from the national and international literature and in these cases it is not known whether the estimates derived were over or under the true costs. However, where possible we have presented conservative estimates for these costs.

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APPENDICES

Appendix 1: Studies of the economic and social costs of alcohol misuse

METHODS

A review of the existing literature was undertaken to locate studies conducted in the UK and other countries that have examined the economic and social costs of alcohol misuse. Literature searches were conducted in Medline and the Health Management Information Consortium (HMIC) database to identify relevant English language studies published since 1999 (see Box 2).

Box 2. Search strategies

Medline (n=101)

1 ((burden or cost) adj (disease or illness or ill health)).ti,ab.
2 ((social or societal) adj cost*).ti,ab.
3 (economic adj (cost* or impact*)).ti,ab.
4 1 or 2 or 3
5 alcohol.ti,ab.
6 4 and 5

HMIC (n=43)

1 alcohol.ti,ab
2 cost*.ti,ab
3 (social OR societal OR economic).ti,ab
4 1 AND 2 AND 3

After removal of duplicates, a total of 140 references were identified. Thirteen references were deemed to be relevant based on abstract and title screening and full copies of these publications were sought, 11 of which were identified as cost-of-illness studies. In addition, the references of retrieved articles and other sources[ix] were scanned for additional references. An additional 16 references were identified in this manner, and therefore a total of 27 cost-of-illness studies were identified that examined the social and economic costs of alcohol use. This section focuses on a detailed analysis of the cost components included across the eight studies[9,21,24-29] that have examined the social and economic costs of alcohol in Scotland and England. The two studies[20,23] that only considered the costs of alcohol use to the NHS were not examined further.

[ix] Other references known to the authors, for example Thavorncharoensap et al.[15]

HEALTHCARE COSTS

A summary of the cost components related to alcohol-related healthcare resource use which have been included in UK studies of the social and economic costs of alcohol misuse is shown in Table 19.

Table 19. Healthcare cost components

Component	Reference						
	England 2000/01[21,22]	London 2000[9]	North Somerset 2000/01[29]	Scotland 2001/02[24,25]	Scotland 2002/03[26]	Scotland 2006/07[27]	Scotland 2007[28]
GP and practice nurse consultations	+	+	+	+	+	+	+
Community psychiatric team	-	-	-	+	+	+	+
Hospital inpatient visits	+	+	+	+	+	+	+[b]
Hospital outpatient visits	+	+	+	+	+	+	+
Day hospital attendances	+	-	-	+	+	+	+
A&E attendances	+	+	+	+	+	+	+
Ambulance services	+	+	+	+	+	+	+
Drug prescriptions	+[c]	-	+[c]	+	+	+[d]	+[e]
Laboratory tests	+	+	-	+	+	+	+
Alcohol treatment services	+	-	+	-[f]	-	-[f]	+
Other	+[g]	-	+[g]	+[h, i]	+[h]	-	-
Total costs (£ million)	**1,383 – 1,683**	**51.7**	**4.7**	**95.6**	**110.5**	**405**	**267.8**

[a] Community psychiatric nurses; [b] Psychiatric, non-psychiatric and maternity; [c] Dependency-prescribed; [d] GP-prescribed; [e] Community-prescribed; [f] Included within social care costs; [g] Counselling, community psychiatric nurse, health visitor and 'other services'; [h] Health board payments; [i] Health visitors.

Health care cost components have included both primary and secondary care costs, and the costs of specialist alcohol treatment services. All studies calculated resource use relating to conditions wholly (e.g. alcoholic liver cirrhosis) and partly (e.g. breast cancer) attributable to alcohol consumption based on alcohol-attributable fractions.

GP and practice nurse consultations

For the studies of alcohol costs in England (including the whole of England,[21] London[9] and North Somerset,[29] respectively) estimates of GP and nurse practice consultations due to alcohol misuse were based on data from the 2000/01 General Household Survey (GHS)[73] combined with, for two studies,[21,29] data from the Birmingham Untreated Heavy Drinkers Study (BUHDS).[47] The 2000 London study[9] used estimates from the 2001/02 Scotland study.[24,25] For the four studies of social and economic costs of alcohol misuse in Scotland,[24-27] estimates for consultations wholly and partly attributable to alcohol were based on data from Scottish general practices (either Continuous Morbidity Recording or the Practice Team Information database in later studies). The proportion of consultations

wholly and partly due to alcohol use were calculated based on alcohol-attributable fractions.[21,24,74]

Community psychiatric team

Only costs relating to community psychiatric nurses were included in the 2000/01 England study, based on service use from the BUHDS.[47] For all four Scottish studies,[24-27] the amount of community psychiatric team contact attributable to alcohol use in Scotland was assumed to be the mid-point between the proportion of GP and inpatient visits attributable to alcohol.

Hospital inpatient visits

Hospital inpatient visits directly and indirectly attributable to alcohol were based on data from hospital admissions databases (Hospital Episode Statistics for England and Scottish Morbidity Record for Scotland). Wholly and partly alcohol-attributable visits were calculated based on alcohol-attributable fractions.[21,24,74]

Hospital outpatient visits

For England and North Somerset, outpatient attendances due to alcohol misuse were based on data from the 2000/01 GHS[73] and BUHDS.[47] For the four studies of alcohol misuse in Scotland,[24-27] outpatient attendances due to alcohol misuse were assumed to be the mid-point between the proportion of GP and the inpatient visits attributable to alcohol. For the 2000 London study,[9] estimates for the proportion of outpatient visits related to alcohol use were based on assumptions from the 2001/02 Scotland study.[24,25]

Day hospital attendances

For the 2000/01 England study,[21] day hospital attendances attributable to alcohol were estimated in the same way as inpatient visits. For the four Scottish studies,[24-27] day hospital attendances due to alcohol were assumed to be the mid-point between the proportion of GP and the inpatient visits attributable to alcohol.

Accident and emergency attendance

In the 2000/01 England study[21] and North Somerset study,[29] accident and emergency (A&E) attendance attributable to alcohol misuse was estimated based on Hospital Activity Statistics and research by MORI.[21] For the 2001/02 and 2002/03 Scotland studies,[24-26] the number of A&E attendances attributable to alcohol misuse were estimated based on data from ISD Scotland and the assumption that 12% of A&E attendances are alcohol-related.[50] For two more recent studies of alcohol-related costs in Scotland,[27,28] the proportion of A&E attendances estimated to be alcohol-related were based on assumptions drawn from the 2000/01 England study[21] and a range of sources,[23,27,51,75,76] respectively.

Ambulance services

Estimates of alcohol-related ambulance service resource use were calculated using an approach similar to the one used to estimate A&E attendance, although the 2007 Scotland study was based on assumptions drawn from different sources.[23,27,77-79]

Drug prescriptions

Data on the number of drug prescriptions attributable to alcohol misuse were drawn from the Prescription Cost Analysis. For the majority of studies,[21,24-27] only the costs of drugs specifically prescribed for alcohol dependency, acamprosate and disulfiram, were included. The 2007 Scotland study[28] also included the proportion of costs attributable to use of naltrexone hydrochloride and benzodiazepines in the treatment of alcohol dependency and alcohol withdrawal syndrome, respectively.

Laboratory tests

The number of laboratory tests attributable to alcohol use was estimated from the number of GP consultations directly attributable to alcohol consumption for all studies except the 2007 Scotland study,[28] which was based on an arbitrary assumption that 25% of patients consulting with a GP or practice nurse because of alcohol misuse would undergo blood and biochemistry tests.

Alcohol treatment services

For studies of the costs of alcohol in England[21] and in North Somerset,[29] spending on specialist alcohol treatment services was based on a mapping of alcohol services by Alcohol Concern.[80] Data from an Audit Scotland report were used to inform the costs estimates presented in the 2007 Scotland study.[81]

Other

In the studies of alcohol-related costs in England and North Somerset, additional costs relating to primary care use, including counselling, health visitors, community psychiatric nurses and other undefined services, were based on data from the 2000/01 GHS[73] and BUHDS.[47] The 2001/02 and 2002/03 Scotland studies,[24-26] included health board payments to alcohol-related voluntary organisations.[82]

SOCIAL CARE COSTS

As shown in Table 20, only the four studies that examined the social and economic costs of alcohol use in Scotland incorporated social care expenditure in the overall costs of alcohol misuse.

Table 20. Social care cost components

Component	Reference						
	England 2000/01[21,22]	London 2000[9]	North Somerset 2000/01[29]	Scotland 2001/02[24,25]	Scotland 2002/03[26]	Scotland 2006/07[27]	Scotland 2007[28]
Children and families services	-	-	-	+	+	+	+
Community care	-	-	-	+	+	+	-
Children's hearing services	-	-	-	+	+	+	+
Criminal justice social work	-	-	-	+	+	+	+
Care homes	-	-	-	-	-	-	+
Total costs (£ million)	**-**	**-**	**-**	**85.9**	**96.7**	**170**	**230.5**

Children and families services

Alcohol-related expenditure on children's social work in Scotland was drawn from Local Government Finance Statistics, and based on the assumption that 24% of cases were related to alcohol misuse.[83] The 2007 Scotland study[28] also presented calculations based on assumptions that between 15% and 45% of social cases were alcohol-related.

Community care

Expenditure on community care for alcohol-related problems, including day centres, residential and nursing homes and other services were only included in the 2001/02 and 2006/07 Scotland studies.[24,25,27] Estimates were based on the assumption that 20%[24,25] and 25%[27] of expenditure on community care services, respectively, was attributable to alcohol misuse. The 2007 Scotland study included expenditure on care homes for adults, assuming that between 25% and 50% of costs were related to alcohol misuse.

Children's hearing services

The numbers of referrals to the Children's Hearing System were drawn from the Scottish Children's Reporter Administration. Assumptions used to calculate the costs of children and families services were applied to estimate the proportion of costs related to alcohol misuse.

Criminal justice social work

The assumption that 27% of alcohol-related community service and probation orders were alcohol-related was used as a proxy for the proportion of criminal justice social work expenditure associated with alcohol misuse in all four Scottish studies.[24-28]

CRIMINAL JUSTICE SYSTEM COSTS

As shown in Table 21, resource use within the criminal justice system was included as a cost component for the majority of studies of the economic and social costs of alcohol use in the UK. Costs incurred in anticipation of, in response to and as a consequence of alcohol-related crime were included in the studies of alcohol-related costs for England,[21] North Somerset[29] and Scotland (2007).[28] Only costs in response to alcohol-related crime were included in the earlier studies of alcohol-related costs in Scotland.[24-27]

Table 21. Criminal justice cost components

Component	Reference						
	England 2000/01[21,22]	London 2000[9]	North Somerset 2000/01[29]	Scotland 2001/02[24,25]	Scotland 2002/03[26]	Scotland 2006/07[27]	Scotland 2007[28]
Anticipation of crime [a]	+	+	+	-	-	-	+
Response to crime[b]	+	+	+	+	+	+	+
Consequences of crime[c]	+	+	+	-	-	-	+
Drink driving	+	+	+	+	+	+	+
Emergency services	-	-	-	-	+	+	-
Total costs (£ million)	**11,940**	**1,674[d]**	**27.3**	**267.9**	**276.7[e]**	**385[e]**	**727.1**

[a] Defensive expenditure (e.g. security measures) and administrative costs for insurance; [b] criminal justice costs including police, court and prison expenditure; [c] Emotional impact on victim, victim services and lost output; [d] violent and 'other' crimes including robbery, burglary, theft and criminal damage; [e] includes fire service expenditure

It is difficult to accurately measure the proportion of crimes and offences that are alcohol-related, and the studies of alcohol-related costs in England and Scotland consequently drew on a range of estimates. For example, the 2000/01 England study[21] and North Somerset study[29] were based on estimates of alcohol-related crime from the NEW-ADAM arrestee survey,[22] and on the assumption that 47% of violent offences[84] and 36% of homicides[85] are alcohol-related. The 2001/02 Scotland study, and the subsequent updates for 2002/03 and 2006/07, were based on the assumption that 25% of crimes and offences are alcohol-related,[86] and the most recent assessment of alcohol-related costs in Scotland[28] used alcohol attributable fractions derived by the University of Sheffield.[87] The source for estimates of the proportion of crimes and offences attributable to alcohol are summarised in Table 22.

Table 22. Source of estimates for the proportion of alcohol-related crimes and offences

Reference	Crimes and offences included	% alcohol-related	*Source*
England 2000/01[21,22] North Somerset 2000/01[29]	Homicide	36%	*Brookman & Maguire*[85]
	Common assault	47%	*British Crime Survey*[84]
	Wounding	47%	*British Crime Survey*[84]
	Sexual offences	13%	*NEW-ADAM*[22]
	Burglary (in business or in a dwelling)	17%	*NEW-ADAM*[22]
	Criminal damage	47%	*NEW-ADAM*[22]
	Robbery (from individual or business)	12%	*NEW-ADAM*[22]
	Theft (from a person; of a pedal cycle; of a vehicle; from a vehicle; attempted vehicle theft; other theft and handling)	13%	*NEW-ADAM*[22]
London 2000[9]	Violent crime	40%	*British Crime Survey*[88]
	Robbery	75%	*Bennett 2000*[89]
	Burglary in a dwelling	8%	*Bennett 2000*[89]
	Burglary in business	17%	*Bennett 2000*[89]
	Theft from a vehicle	0%	*Bennett 2000*[89]
	Theft of a vehicle	30%	*Bennett 2000*[89]
	Shoplifting	7%	*Bennett 2000*[89]
	Other theft	13%	*Bennett 2000*[89]
	Criminal damage	29%	*Bennett 2000*[89]
Scotland 2001/02[24,25] Scotland 2002/03[26]	Serious assault (including homicide); handling offensive weapons; robbery; other non-sexual violent crimes; sexual assault; lewd and indecent behaviour; other crimes of indecency; housebreaking; theft by opening lockfast places; theft of a motor vehicle; shoplifting; other theft; fraud; other crimes of dishonesty; criminal damage; crimes against public justice; drugs; other crimes; simple assault; breach of the peace; other misc offences; motor vehicle offences	25%	*Bennett 1998*[86]
Scotland 2006/07[27]	Serious assault	40%	*Unclear*
	Rape and attempted rape	40%	*Unclear*
	Minor assault	40%	*Unclear*
	All other recorded crime	25%	*Bennett*[86]
Scotland 2007[28]	Serious assault, other non-sexual crimes of violence	3-48%	*University of Sheffield*[87]
	Robbery	1-11%	*University of Sheffield*[87]
	Total sexual offences	2-43%	*University of Sheffield*[87]
	Housebreaking (domestic dwelling/non-dwelling and other)	1-11%	*University of Sheffield*[87]
	Theft from or of a motor vehicle	0-46%	*University of Sheffield*[87]
	Shoplifting	1-11%	*University of Sheffield*[87]
	Other theft	1-11%	*University of Sheffield*[87]
	Criminal damage	4-58%	*University of Sheffield*[87]
	Minor assault	1-36%	*University of Sheffield*[87]

Costs associated with alcohol-specific crimes in the 2000/01 England study[21] included drunkenness in custody suites, costs incurred in Magistrate Courts when processing drunkenness, disorder and other related offences, and drink driving. For custody costs, estimates of the costs for alcohol-specific and alcohol-related arrests[90] were combined with estimates of the proportion of alcohol-related crimes and offences[22] and numbers of arrests.[91] Estimates for costs incurred in Magistrate Courts were taken from the Criminal Justice Statistics for England and Wales.[92] Drink driving costs included those related to arrest,[90] proceedings at Magistrate and Crown courts,[93] lost output, the health service and

human costs.[94-96] For the four Scottish studies,[24-28] drunkenness and drunk driving were included as alcohol-specific costs and included those related to custody, court proceedings and prosecution, and imposing penalties.

Anticipation of crime

Costs in anticipation of crime, including security expenditure and insurance administration, were included in the studies of alcohol-related costs for England,[21] London,[9] North Somerset[29] and Scotland (2007).[28] Cost estimates were based on unit costs drawn from Home Office studies of the economic and social costs of crime.[59,60]

Consequences of crime

Costs as a consequence of crime, covering the cost of damaged or stolen property, victim support, the physical and emotional impact of crime and lost output, were included in the studies of alcohol-related costs for England,[21] London,[9] North Somerset[29] and Scotland (2007).[28] Cost estimates were based on unit costs drawn from Home Office studies of the economic and social costs of crime.[59,60]

Response to crime

Costs incurred as a result of crime through the criminal justice system were included in all studies, and included costs related to the police, courts and prison and probation services. For studies of alcohol-related costs in England,[21] London,[9] North Somerset[29] and Scotland (2007),[28] the average costs of alcohol-related crime and offences were based on Home Office estimates of the economic and social costs of crime.[59,60] For the earlier studies of alcohol-related crime in Scotland,[24-27] costs were drawn from expenditure on the police, courts and prisons in Scotland.

WORKPLACE AND PRODUCTIVITY COSTS

The majority of studies that have examined the social and economic costs of alcohol use in the UK have considered the impact of alcohol on the workplace and wider economy. Excessive alcohol consumption affects the workplace through impaired performance at work ('reduced productivity'), and by increasing the likelihood of employees being absent from work ('absenteeism'). In addition, heavy and dependent drinkers may be more likely to be unemployed. Alcohol also contributes to lost productivity in the workplace through premature deaths related to alcohol use. As shown in Table 23, all eight studies examined alcohol-related costs associated with the workplace and wider economy.

Table 23. Workplace and productivity costs

Component	Reference						
	England 2000/01[21,22]	London 2000[9]	North Somerset 2000/01[29]	Scotland 2001/02[24,25]	Scotland 2002/03[26]	Scotland 2006/07[27]	Scotland 2007[28]
Premature mortality	+	-	+	+[a]	+	+	+
Absenteeism	+	+	+	+	+	+	+
Reduced productivity	-[b]	-	-	-	-	+	+
Unemployment	+	-	+	+	+	+	+
Total costs (£ million)	**5,194 – 6,421**	**294**	**15.5**	**404.5**	**417.8**	**820**	**865.7**

[a] Working and non-working population; [b] Not able to calculate

Premature mortality in the working population

Deaths directly and indirectly related to alcohol misuse were estimated based on data from Mortality Statistics for England and Wales[97] for the studies of costs in England, and from the General Register Office for studies of costs in Scotland. The numbers of alcohol-related deaths were used to estimate the number of years of working life lost, based on the assumption that men and women retire at the age of 65. Data on economic activity in the UK were drawn from the Labour Force Survey. For the 2000/01 England, 2006/07 Scotland and 2007 Scotland studies,[21,27,28] costs were estimated based on the HCA, that is, lost output due to premature mortality was estimated as the product of the number of alcohol-related deaths and the present value of future earnings based on average wages (for example, from the New Earnings Survey[98] or more recently the Annual Survey of Hours and Earnings[99]). The 2001/02 Scotland study[24,25] used the WTP approach, which involves assessing the monetary value which people put on reducing the risks associated with mortality. The costs associated with premature mortality among the working population were based on the value for a year of life derived by the then Department of the Environment, Transport and the Regions (DETR) of £27,022 (2001/02 prices).

Absenteeism

For the 2000/01 England study, employee absences due to alcohol dependence were estimated to be 1.27 times more likely than among those without alcohol dependence and absences due to alcohol-related injury were assumed to contribute to two additional days of absence over and above the population average.[100] After accounting for part-time and full-time employment rates in 2001, and based on estimates of alcohol dependency among employees,[101] almost 11 million days were estimated to have been lost among alcohol dependent employees. Incorporating absences due to alcohol-related injuries, based on national prevalence rates for alcohol consumption,[73] an upper estimate of around 17 million days lost due to alcohol misuse was calculated. The 2001/02 Scotland report only included days lost due to alcohol dependency. Assuming that alcohol dependent employees in Scotland,[102] were three times more likely to be absent than non-dependent employees resulted in an additional 1,164,344 working days lost due to alcohol dependency. The 2006/07 and 2007 Scotland studies,[27,28] were based on estimates from the 2000/01 England study that between 6 and 15% of working days were lost to alcohol misuse.[x] These estimates were applied to national level data on absenteeism (2006 and 2008 CBI survey) adjusted to Scotland.

Reduced productivity

No alcohol-related costs for reduced productivity in the workplace were calculated for the 2000/01 England study,[21,22] or the earlier estimates of the economic and social costs of alcohol in Scotland.[24-26] Based on a survey of employees by reed.co.uk, calculations of reduced productivity in the workplace in the 2006/07 and 2007 Scotland studies[27,28] were based on the assumption that an average of 0.68 days[xi] annually were lost due to alcohol-related reduced productivity in the workplace.

Unemployment

The 2000/01 England study was based on data showing that heavy male drinkers (>50 units a week) spend an average of 11.4 days per annum out of employment.[62] A high estimate of the number of days out of employment for heavy drinkers also included female drinkers. The 2001/02 Scotland study[24,25] used data on the prevalence rate for alcohol dependency stratified by employment status[102] to calculate the unemployment rate among those with alcohol dependency. This in turn was used to calculate the excess employment rates among males and female dependent drinkers. The 2006/07 Scotland study[27] replicated the methodology presented in this earlier Scottish study, and the 2007 Scotland study[28] presented estimates based on both approaches.

[x] Estimates presented in the 2000/01 England study actually corresponds to 6-10% of days lost.

[xi] Respondents reported turning up to work with a hangover on average two and a half days a year and reported themselves to be 27% less efficient on these days.

INTANGIBLE COSTS

As shown in Table 24, attempts were made to calculate the human costs (e.g. pain and suffering) associated with alcohol-related morbidity and mortality in the studies of alcohol-related costs in England[21] and Scotland.[24-28] These costs are known as 'intangible' costs, because of the difficulties in quantifying and measuring them.

Table 24. Human costs associated with alcohol misuse

Component	Reference						
	England 2000/01[21,22]	London 2000[9]	North Somerset 2000/01[29]	Scotland 2001/02[24,25]	Scotland 2002/03[26]	Scotland 2006/07[27]	Scotland 2007[28]
Human costs associated with premature death	-[a]	-	-[a]	-	-	-	+
Premature mortality, non-working population	-	-	-	+	-	+	+
Premature mortality, post-retirement population	-	-	-	-	-	-	+
Total costs (£ million)	**-[c]**	**-**	**-[c]**	**216.7**	**223.8**	**-[c]**	**1,464.6**

[a] Included in workplace and productivity costs; [b] Not included in total cost estimates; [c] No cost estimate presented.

The 2000/01 England study[21,22] discussed the human costs associated with alcohol-related morbidity and mortality but these costs were not quantified as no current UK studies were identified that examined the value of human costs associated with alcohol misuse. The 2001/02 study of alcohol-related costs in Scotland[24,25] and subsequent updates in 2002/03 and 2006/07[26,27] estimated the costs of premature mortality among the non-working population using a value for a year of life derived by DETR of £27,022 (2001/02 prices). This estimate was produced using a WTP approach, as described in Section 0. The most recent analysis of alcohol-related costs in Scotland (2007)[28] used two potential values for a year of life: (1) £30,000 based on the upper threshold QALY used by the National Institute for Health and Clinical Excellence; and (2) £50,000 based on the views of the Department of Health.

OTHER SOCIAL AND ECONOMIC COSTS

Other costs associated with alcohol use were considered across the included studies. These included costs related to the fire service,[27,28] research and prevention,[21,24,25] and the benefits of alcohol consumption.[9]

Fire service

The two most recent studies of the social and economic costs of alcohol misuse in Scotland[27,28] considered the costs to fire service. For the 2006/07 Scotland study,[27] costs relating to the attendance of fire fighting and rescue services at fires started deliberately were included, of which 25% were assumed to alcohol-related. The 2007 Scotland study[28] included the cost of fire service attendance at alcohol-related road traffic accidents and at house fires, in which alcohol was a direct or indirect factor. These two cost estimates were not able to be quantified in the 2001/02 Scotland study.[24]

Research and prevention

Costs relating to expenditure for alcohol-related research and prevention efforts were incorporated in the 2000/01 England and 2001/02 Scotland studies.[21,24] It was not clear how much expenditure on research costs was included in the 2000/01 England study. Costs relating to health promotion and prevention by the Health Education Board for Scotland (HEBS), Scottish Executive and Health Boards were included in the 2001/02 Scotland study at a total annual cost of £1.2 million.[24,25]

Benefits of alcohol consumption

Only one study, of the economic costs of alcohol in London,[9] attempted to calculate the benefits of alcohol consumption. The following 'benefits' of alcohol consumption were considered: distribution of alcohol expenditure between employees, businesses and government; individual pleasure gained from drinking; and the wider effects of alcohol consumption such as increases in employment in the alcohol service and tourism industries. The output, income and employment generated by the alcohol industry were not considered as measures of social benefits in the study of the costs of alcohol misuse in England,[21] as the authors argued that it was unlikely that "in the absence of alcohol consumption in the economy the money spent on alcohol would not have been used elsewhere" (pg 13). In addition, external benefits were not included as no research has been conducted that has assigned monetary values to alcohol's contribution to the development of social networks and social capital. The 2000 London study[9] included an estimate of the consumer surplus[xii] related to alcohol consumption. The authors calculated that the real

[xii] A measure of the difference between what a person is willing to pay for a commodity and the amount he or she is actually required to pay.[21]

pleasure of drinking alcohol to consumers in London was around 50% more than what they actually spent on purchasing it.

Costs not considered

Litter costs associated with alcohol use include discarded bottles, cans and broken glass.[43] However, none of the studies of the social and economic costs of alcohol misuse in the UK, or internationally, examined costs associated with the impact of alcohol on the environment. This appears to be because adequate data on the basis of which it would be possible to estimate alcohol-related litter costs are currently unavailable.

ESTIMATING THE SUBNATIONAL COSTS OF ALCOHOL MISUSE

Bolam and Coast[29] compared the results of simple population-based calculations with more complex methods for estimating the economic cost of alcohol misuse in North Somerset. Both methods were based on those of the 2000/01 England study.[21,22] Using the simple method, the authors calculated the population-attributable fraction for both the lower and upper estimates of national costs for all costing areas of the 2000/01 England study.[21,22] The more complex method involved replicating the 2000/01 England study[21,22] by applying local data to each of the individual costing areas. The authors found that the simple method provided only a crude estimate of the economic burden in North Somerset and concluded that more accurate assessment of sub-national costs warranted detailed study of each cost area.

Appendix 2: Additional tables

Table 25. Alcohol-related inpatient episodes: NI39

Diagnosis	Number of alcohol-related inpatient episodes	Number of alcohol-related day patient episodes	Number of bed days
Mental and behavioural disorders due to use of alcohol	1,616	1,153	5,835
Degeneration of nervous system due to alcohol	4	2	22
Alcoholic polyneuropathy	2	2	10
Alcoholic myopathy	1		3
Alcoholic cardiomyopathy	4	2	25
Alcoholic gastritis	13	3	22
Alcoholic liver disease	418	156	2,353
Chronic pancreatitis (alcohol induced)	130	54	624
Ethanol poisoning	304	359	495
Toxic effect of alcohol, unspecified	36	32	54
Accidental poisoning by and exposure to alcohol	6	3	15
Malignant neoplasm of lip, oral cavity and pharynx	74	33	1,313
Malignant neoplasm of oesophagus	54	25	1,441
Malignant neoplasm of colon	9	10	2,677
Malignant neoplasm of rectum	11	11	1,695
Malignant neoplasm of liver and intrahepatic bile ducts	8	2	398
Malignant neoplasm of larynx	13	9	490
Malignant neoplasm of breast	45	22	2,453
Epilepsy and Status epilepticus	679	335	4,962
Hypertensive diseases	1,856	1,498	41,702
Cardiac arrhythmias	1,279	542	24,711
Haemorrhagic stroke	22	5	928
Ischaemic stroke	11	3	658
Oesophageal varices	15	45	276
Gastro-oesophageal laceration-haemorrhage syndrome	8	7	30

Diagnosis	Number of alcohol-related inpatient episodes	Number of alcohol-related day patient episodes	Number of bed days
Unspecified liver disease	64	42	564
Acute and chronic pancreatitis	56	12	1,544
Psoriasis	41	54	1,082
Spontaneous abortion	33	161	267
Pedestrian traffic accidents	18	8	381
Road traffic accidents – non-pedestrian	45	30	1,206
Water transport accidents	0	0	1
Air/space transport accidents	0		16
Fall injuries	241	184	14,042
Work/machine injuries	13	23	384
Firearm injuries	3	2	44
Drowning	2		35
Inhalation of gastric contents/Inhalation and ingestion of food causing obstruction of the respiratory tract	5	2	32
Fire injuries	6	3	57
Accidental excessive cold	3		73
Intentional self-harm/Event of undetermined intent	287	295	1,535
Assault	97	158	863
Total	**4,997**	**3,519**	**105,860**

Source: NWPHO

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ISBN 978-1-907441-95-0 (printed version)

ISBN 978-1-907441-96-7 (web version)

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