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AN ROINN
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MÄNNYSTRIE O
Poustie, Resydènter Heisin an Fowk Siccar

Social Costs of Alcohol Misuse in Northern Ireland for 2008/09

FGS McClure Watters

York Health Economics Consortium

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The views expressed in this report are those of the authors

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1 INTRODUCTION, BACKGROUND AND TERMS OF REFERENCE

1.1 Introduction

In 2009, the Department of Health, Social Services and Public Safety (DHSSPS) appointed FGS McClure Watters, in partnership with the York Health Economics Consortium, to undertake a review of the social costs of alcohol misuse in Northern Ireland.

1.2 Background to the Assignment

DHSSPS's mission is to improve the health and social wellbeing of the people of Northern Ireland, through the provision of appropriate health and social care services in both clinical and community settings.

1.2.1 DHSSPS's Role in Addressing Alcohol Misuse

Reducing drug and alcohol misuse is a central strand of DHSSPS's efforts to improve public health across Northern Ireland, and the Department has actively engaged in this area over the course of recent years through its New Strategic Direction for Alcohol and Drugs (NSD).

The NSD sets out a number of aims for the reduction of alcohol-related harm, among both younger and older sections of the population for Northern Ireland as a whole and at sub-regional levels. Patterns of alcohol misuse and binge drinking are examined in Section 4 of the report.

In addition, its current Public Service Agreement sets the Department a string of targets in relation to reducing binge-drinking, particularly among young people and vulnerable groups:

- By 2010, ensuring a 5% reduction in the proportion of adults who binge-drink;
- By 2010, ensuring a 10% reduction in the proportion of young people who drink and who report getting drunk; and
- By 2011, ensuring a 10% reduction in the number of children at risk from parental alcohol dependency.

Reducing the incidence of alcohol misuse is therefore a very important part of DHSSPS's remit, both through providing individuals who use alcohol to excess and by investing in a mix of upstream services and interventions to prevent the harm caused by alcohol misuse.

1.2.2 Understanding the Impacts of Alcohol Misuse

Reducing the harm caused by alcohol misuse is a very significant element of the public health agenda in Northern Ireland. The Institute of Alcohol Studies has estimated[1] that alcohol is a

[1] Institute of Alcohol Studies Factsheet – 'Alcohol and Health', 2008

bigger factor than high cholesterol levels, obesity, diabetes and asthma in causing ill-health and premature deaths in Europe, and accounts for almost 10% of these deaths.

The potential impacts of alcohol misuse on society in Northern Ireland are far-reaching, in terms of both the areas affected and the magnitude of the effects themselves. Aside from its human cost, alcohol misuse is likely to place a significant burden of additional expenditure on the public services, in a wide range of areas, such as healthcare, public safety, social work and criminal justice, as well as generating other costs in the wider economy.

A number of recent studies have sought to quantify the financial and economic cost of alcohol misuse in settings outside Northern Ireland. A 2010 study by the Scottish Government[2] estimated the annual cost of alcohol misuse to society in Scotland was around £3.6bn at 2007 prices, of which some £268m was attributable to the health service. For a country of 5.1m people, this would represent an overall cost per capita of £706, of which £53 per head would relate to the health service.

The English Department of Health recently estimated[3] that the annual cost of alcohol misuse to the National Health Service (NHS) alone was in the region of £2.7bn. Across a population of 51.4m, this would equate to a per-capita cost of £53 in terms of the NHS.

Some international commentators have suggested[4] that, while definitions of the term differ by country, 'moderate' alcohol consumption may confer health benefits on some people, principally by reducing the risk of coronary heart disease among middle-aged and older people. However, there is much less evidence that alcohol consumption is necessary for the maintenance of good health.

The full net social cost of alcohol misuse in Northern Ireland has not been estimated recently, but it is likely to be significant based on evidence from other jurisdictions, and therefore to remain at the forefront of the Department's thinking for some time to come.

1.3 Terms of Reference

As per DHSSPS's Terms of Reference for the assignment, we were commissioned to develop an estimate of the overall cost of alcohol misuse in Northern Ireland, including:

- A comprehensive literature review, considering the existing evidence base on methods of estimating the social costs of alcohol misuse, as well as the current research studies on the potential health benefits of alcohol;
- A full examination and analysis of the data available to calculate an estimate of the cost of alcohol misuse in Northern Ireland; and
- An estimate of the cost to society arising from alcohol misuse in Northern Ireland.

[2] Scottish Government, 'The Societal Cost of Alcohol Misuse in Scotland for 2007', 2010
[3] Department of Health, 'The Cost of Alcohol Harm to the NHS in England', 2008
[4] Institute of Alcohol Studies, *ibid*

1.4 Structure of the Report

The remainder of the report is structured as follows:

- Section 2 presents an Executive Summary;
- Section 3 reviews relevant literature and other evidence on the impacts of alcohol misuse and any health benefits associated with alcohol;
- Section 4 outlines our approach to sourcing and analysing data for the study;
- Section 5 examines alcohol-related costs within healthcare, including hospital, GP and ambulance services;
- Section 6 addresses alcohol-related costs within social work, including social services for children and families and the youth justice system;
- Section 7 considers costs falling on the emergency services, in areas such as policing and fire services;
- Section 8 explores the cost burden on criminal justice in relation to courts and prisons;
- Section 9 sets out the wider economic costs linked to alcohol misuse, including reduced productivity, absenteeism from work and premature mortality; and
- Section 10 draws together our work in preceding sections into an overall estimate of the social costs of alcohol misuse in Northern Ireland, including sensitivity analysis where necessary.

2 EXECUTIVE SUMMARY

2.1 Study Aims

This study sets out to estimate the overall social costs of alcohol misuse in Northern Ireland, encompassing a number of key themes:

- **Healthcare**, in terms of additional visits to GPs, hospital inpatient stays and visits to hospitals as outpatients;
- **Social work** and additional services carried out by Health and Social Care Trusts on community care and children's services;
- **Public safety**, in relation to additional activity by the Police Service of Northern Ireland and the Northern Ireland Fire and Rescue Service;
- **Criminal justice**, in terms of additional work generated for the Northern Ireland Court Service, Public Prosecution Service, Northern Ireland Legal Services Commission and Northern Ireland Prison Service; and
- **Wider economic costs**, including the impact of alcohol misuse on factors such as unemployment and absenteeism.

2.2 Study Methodology

Our cost estimates in the study have been developed using two main principles:

- Estimating activity levels and applying unit costs to these (e.g. acute hospital bed days for conditions associated with alcohol misuse); and
- Estimating a relevant proportion of the total expenditure on a specific aspect of service provision (e.g. proportion of fire service expenditure in responding to alcohol-related incidents).

Due to constraints on the availability of specific information within the Northern Ireland context, the estimates developed for the study contain an inherent degree of uncertainty and the costs generated from our work should therefore be considered as indicative.

In developing our cost estimates, we made as much use as possible of information published officially by Government Departments and Agencies, supplemented by other data held but not routinely published. Where necessary, we also made carefully thought-out assumptions in a number of areas of the study, drawing on evidence from similar recent studies in Scotland and England. These include:

- The proportion of attendances at Accident and Emergency facilities which are linked to alcohol misuse;
- The proportion of recorded crime associated with alcohol misuse; and
- The proportion of workers' productive time lost due to the effects of alcohol misuse.

2.3 Potential Health Benefits of Alcohol Consumption

In addition to our cost review work, we examined the international research base regarding alcohol consumption and found evidence that:

- Light to moderate consumption may bring some health benefits to certain population groups, but excessive consumption increases risks to health; and
- The principal health benefits of moderate alcohol consumption relate to conditions such as heart disease and stroke.

2.4 Overall Summary of Cost Estimates

The table below brings together the overall results of our analysis of costs arising within healthcare, social work, the fire and police services, the criminal justice system and the wider economy.

In developing and presenting our overall estimate of the total cost of alcohol misuse, we have categorised our analysis of individual cost elements into either:

- **Firm estimates,** where we have been able to obtain robust, recent source data for the Northern Ireland context from Government Departments and Agencies; or
- **Outline estimates**, covering areas of our analysis which have been subject to greater levels of uncertainty (for example, where the data available for Northern Ireland is a number of years old, or where we have had to make significant assumptions in developing the cost estimates, using data sourced from Scotland or England).

For each of the above estimates, we have set out:

- Our **base case,** representing the firm or outline estimates calculated on the basis detailed above – in other words, the best estimate identified for each cost; and
- The results of our **sensitivity analysis,** examining the impact of variations in key assumptions underpinning our estimates.

In performing our sensitivity analysis, we have taken into account the results of a number of recent studies of the social costs of alcohol misuse, as well as the potential impact of more general variations in costs.

The detailed steps we have performed in developing each individual cost estimate are set out in full in the relevant sections of the report.

In areas of the study where we have been able to base our analysis on specific information furnished by data providers, we have categorised our cost estimates as firm, and applied a general sensitivity of +/-10% in our analysis. As an example, our estimate for the cost of acute hospitalisation days associated with alcohol misuse (Section 5.5) has been developed using specific source information from DHSSPS, and we have therefore categorised the estimate as firm.

For other areas of the study, where we have been able to develop only outline estimates, we have followed two key principles in performing sensitivity analysis:

- Where other recent studies have contained a range of estimates (e.g. on the proportion of specific cost elements relating to alcohol misuse), we have reflected these variations in our sensitivity analysis; and
- For other outline estimates, we have applied a wider general sensitivity of +/-25% to reflect a higher level of inherent uncertainty.

For example, a number of recent studies elsewhere in the UK have sought to identify the proportion of Accident and Emergency (A&E) attendances associated with alcohol misuse (Section 5.7), and have produced estimates as diverse as 2%, 25% and 45%. In this area of the study, we have therefore used a proportion of 25% in developing our base case, and adopted proportions of 2% and 45% in our sensitivity analysis.

In contrast, for our analysis of the proportion of court costs connected to alcohol-related crime (Section 8.2), we have instead applied a general sensitivity of +/-25% around the base-case estimate developed using evidence from Scotland, in the absence of other reliable data.

This approach was intended to ensure our analysis was as robust and evidence-based as possible, while recognising that cost estimates in a number of areas may be subject to a degree of uncertainty.

Table 2.1: Overall Summary of Cost Estimates

Cost Element	Section	ANNUAL COST ESTIMATE			
		Firm or Outline	Base Case	Lower	Upper
			£m	£m	£m
GP-prescribed drugs	5.2	Firm	**0.3**	0.3	0.3
GP/practice nurse consultations attributable to alcohol	5.3	Outline	**9.3**	4.6	14.0
Laboratory testing in primary care	5.4	Outline	**0.1**	0.1	0.1
Hospitalisation days – acute	5.5	Firm	**65.5**	60.0	72.1
Hospitalisation days – mental illness	5.6	Outline	**8.6**	6.5	10.8
A&E attendances	5.7	Outline	**16.6**	1.3	30.5
Outpatient hospital visits	5.8	Outline	**5.2**	4.8	5.4
Day hospital visits – mental illness	5.9	Outline	**<0.1**	<0.1	<0.1
Day hospital visits – non-mental illness	5.10	Firm	**1.9**	1.7	2.1
Community psychiatric teams	5.11	Outline	**4.2**	3.2	5.3

Cost Element	Section	ANNUAL COST ESTIMATE			
		Firm or Outline	Base Case	Lower	Upper
			£m	£m	£m
Health promotion	5.12	Firm	**0.4**	0.3	0.4
Drug and Alcohol Coordination Teams	5.13	Outline	**3.5**	2.6	4.3
Ambulance journeys	5.14	Outline	**6.5**	4.3	12.6
TOTAL ESTIMATED COST TO HEALTHCARE			**122.2**	**89.8**	**158.0**
Children and family services	6.2	Outline	**36.9**	23.1	69.2
Youth justice	6.3	Firm	**3.6**	3.3	4.0
Criminal justice social work	6.4	Firm	**8.0**	7.2	8.8
TOTAL ESTIMATED COST TO SOCIAL WORK			**48.5**	**33.6**	**82.0**
Fire service callouts	7.2	Outline	**0.4**	0.3	0.5
Policing for alcohol-related crime	7.3	Outline	**0.7**	0.5	0.8
Policing for violent crime partly related to alcohol	7.4	Outline	**89.7**	67.3	112.1
Policing for other crime partly related to alcohol	7.5	Outline	**132.8**	99.6	165.9
TOTAL ESTIMATED COST TO FIRE AND POLICE SERVICES			**223.6**	167.7	279.3
Court costs for violent crime related to alcohol	8.2	Outline	**2.5**	1.9	3.2
Court costs for other crime related to alcohol	8.3	Outline	**16.6**	13.9	19.3
Public prosecution costs for violent crime related to alcohol	8.4	Outline	**1.4**	1.1	1.8
Public prosecution costs for other crime related to alcohol	8.5	Outline	**9.4**	7.1	11.8
Legal Aid costs for violent crime related to alcohol	8.6	Outline	**1.4**	1.1	1.8
Legal Aid costs for other crime related to alcohol	8.7	Outline	**9.1**	6.8	11.4
Prison costs for violent crime related to alcohol	8.8	Outline	**33.7**	25.2	42.1
Prison costs for other crime related to alcohol	8.9	Outline	**9.7**	7.3	12.2

Cost Element	Section	Firm or Outline	ANNUAL COST ESTIMATE Base Case £m	Lower £m	Upper £m
TOTAL ESTIMATED COST TO COURTS AND PRISONS			**83.8**	**64.4**	**103.6**
Presenteeism at work	9.2	Outline	**77.5**	58.1	96.9
Absenteeism from work	9.3	Outline	**33.1**	18.9	47.4
Unemployment	9.4	Outline	**50.0**	37.5	62.5
Premature mortality among people of working age	9.5	Outline	**41.1**	30.8	51.4
TOTAL ESTIMATED COST TO WIDER ECONOMY			**201.7**	**145.3**	**258.2**
TOTAL ESTIMATED COST			**679.8**	**500.8**	**881.1**

As a base case, we estimate that alcohol misuse generates overall social costs of some **£679.8m** per annum in Northern Ireland, across the areas considered in the report, at 2008-09 prices.

In a number of areas of our analysis, we have developed pragmatic assumptions based on evidence from recent studies in Great Britain, most notably in Scotland. In these areas, after reviewing patterns of alcohol consumption in Northern Ireland and Scotland, we have scaled back our estimates for Northern Ireland by a notional 10% in the analysis above, to reflect differences in the degree of harm attributable to alcohol misuse in the two jurisdictions. Section 4 of the report presents further information on the basis for the notional 10% reduction which we have applied.

Table 2.2 below presents our base case cost estimates including and excluding any adjustment for the Northern Ireland context to indicate that whatever notional adjustment we would or should make, it does not significantly change the overall costs from our analysis:

Table 2.2: Overall Summary of Cost Estimates (With and Without Adjustment)

Cost Element	With Adjustment £m	Without Adjustment £m
GP-prescribed drugs	**0.3**	0.3
GP/practice nurse consultations attributable to alcohol	**9.3**	10.4
Laboratory testing in primary care	**0.1**	0.1
Hospitalisation days – acute	**65.5**	65.5
Hospitalisation days – mental illness	**8.6**	9.5
A&E attendances	**16.6**	18.4
Outpatient hospital visits	**5.2**	5.8
Day hospital visits – mental illness	**<0.1**	<0.1
Day hospital visits – non-mental illness	**1.9**	1.9
Community psychiatric teams	**4.2**	4.7
Health promotion	**0.4**	0.4
Drug and Alcohol Coordination Teams	**3.5**	3.5
Ambulance journeys	**6.5**	7.2
TOTAL ESTIMATED COST TO HEALTHCARE	**122.2**	**127.8**
Children and family services	**36.9**	41.0
Youth justice	**3.6**	3.6
Criminal justice social work	**8.0**	8.0
TOTAL ESTIMATED COST TO SOCIAL WORK	**48.5**	**52.6**
Fire service callouts	**0.4**	0.4
Policing for alcohol-related crime	**0.7**	0.7
Policing for violent crime partly related to alcohol	**89.7**	99.7
Policing for other crime partly related to alcohol	**132.8**	147.5
TOTAL ESTIMATED COST TO FIRE AND POLICE SERVICES	**223.6**	**248.3**
Court costs for violent crime related to alcohol	**2.5**	2.8
Court costs for other crime related to alcohol	**16.6**	17.8
Public prosecution costs for violent crime related to alcohol	**1.4**	1.6
Public prosecution costs for other crime related to alcohol	**9.4**	10.4
Legal Aid costs for violent crime related to alcohol	**1.4**	1.6

Cost Element	With Adjustment	Without Adjustment
	£m	£m
Legal Aid costs for other crime related to alcohol	**9.1**	10.1
Prison costs for violent crime related to alcohol	**33.7**	37.4
Prison costs for other crime related to alcohol	**9.7**	10.8
TOTAL ESTIMATED COST TO COURTS AND PRISONS	**83.8**	**92.5**
Presenteeism at work	**77.5**	86.1
Absenteeism from work	**33.1**	33.1
Unemployment	**50.0**	55.6
Premature mortality among people of working age	**41.1**	41.1
TOTAL ESTIMATED COST TO WIDER ECONOMY	**201.7**	**215.9**
TOTAL ESTIMATED COST	**679.8**	**737.1**

The cost estimates produced do not vary significantly between the two scenarios above.

3 REVIEW OF LITERATURE ON IMPACTS OF ALCOHOL MISUSE

3.1 Introduction

This section of the report summarises our review of relevant literature and other evidence on the impacts of alcohol misuse, the consideration of previous similar work to estimate the social costs of alcohol misuse in other jurisdictions and the current debate around research studies into any possible health benefits of alcohol.

3.2 Literature Searches Required

For our work on the review, we carried out literature searches in three broad areas:

- **Cost of Illness (COI)** study methods;
- COI studies specifically relevant to alcohol misuse; and
- Research studies and data with more recent and/or more robust data for the estimates of alcohol misuse.

Below, we set out both the search terms we used and the resources we identified.

3.3 Search Strategy

3.3.1 COI Study Methods and Alcohol COI Studies

For our work on the study, we carried out research on COI study methods and alcohol COI studies using a strategy derived from our proven technical framework for literature reviews.

We initially conducted a full search of the UK and international evidence bases on the costs which alcohol misuse brings about, across a range of areas of society, including:

- Primary and secondary healthcare
- Criminal justice system
- Wider economic costs
- Social work and children's services
- Emergency services
- Other alcohol-related costs

Our technical framework and decision rules for including literature in the scope of our search are set out in Appendix 1 to the report.

3.3.2 Outputs from Literature Review

We have used the key publications identified through the literature search to:

- Consider recent developments in undertaking generic COI studies to determine whether some or all these developments need to be taken into account within this research on alcohol misuse;

- Determine the specific aspects that should be included in a study of the costs associated with alcohol misuse (e.g. alcohol-related health care costs; alcohol-related criminal justice costs). We initially sought to identify all desirable elements of the costs of alcohol misuse, even if the necessary quantitative data may not be recorded or available within Northern Ireland; and

- Determine the specific service elements that should be included within each aspect (e.g. GP prescribing; community-based support) to reflect current modes of treatment delivery and service responses to alcohol misuse (which may have changed considerably in recent years).

3.4 Approaches to Estimating Social Costs of Alcohol Misuse

As part of our work on the study, we have reviewed more than 100 sources of literature directly relevant to estimating the social costs of alcohol misuse, drawn from both the UK and other international jurisdictions.

Within this review, we have examined the advantages and disadvantages of different approaches to cost estimation, including:

- **Cost of Illness approach:** Studies undertaken using this approach aim to measure the economic burden of a condition and estimate the maximum amount that could potentially be saved or gained if the condition in question were to be eradicated, incorporating both direct and indirect costs;

- **Willingness to Pay approach:** This approach seeks to estimate individual consumers' willingness to pay in order to reduce their health risks and bring about improvements to their health; and

- **Human Capital approach:** A method for estimating the impact of an individual's illness or premature death on society by measuring the discounted value of his/her productivity loss (labour earnings) due to morbidity or premature mortality.

Each of the approaches above has its own advantages and disadvantages, and none can be considered as producing a perfect measure of the social costs of alcohol misuse. However, a substantial body of academic research suggests that it is more practical to develop cost estimates using the COI methodology than using the other two approaches, where relevant information is less readily available. For example:

- While highlighting some limitations on the usefulness of COI studies due to inherent variability in the approaches taken to them, Clabaugh and Ward (2008)[5] conclude that COI studies can present useful opportunities to communicate with the public and policymakers on the relative importance of specific diseases and injuries;

- Although noting that COI studies are of less use in setting priorities for investment in research or treatment, Roux and Donaldson (2004)[6] assert that data from these studies

[5] Clabaugh, G. and M.M. Ward (2008), 'Cost-of-Illness Studies in the United States: A Systematic Review of Methodologies Used for Direct Cost'
[6] Roux, L. and C. Donaldson (2004), 'Economics and Obesity: Costing the Problem or Evaluating Solutions?'

may assist in focusing interest or resources on specific problems and provide some indication of potential cost savings from targeted interventions; and

- Moore and Caulkins (2006)[7] pointedly suggest there is:

'...currently no good alternative to COI studies for monetising the benefits of reductions in substance abuse...'

For this reason, and in line with similar recent studies in Scotland and England, we have therefore based our analysis of the social costs of alcohol misuse in Northern Ireland on a COI approach.

3.5 Themes for Analysis

COI studies generally examine the following costs:

- **Direct costs** (e.g. those arising within the health service in directly addressing problems associated with alcohol misuse); and
- **Indirect costs** (e.g. productivity losses to the economy arising from alcohol misuse).

Consistent with a range of recent UK studies, Sections 5 to 9 of the report examine the social costs of alcohol misuse in Northern Ireland across a number of themes, as detailed below:

- **Healthcare**, in terms of additional visits to GPs, hospital inpatient stays and visits to hospitals as outpatients (Section 5);
- **Social work** and additional services carried out by Health and Social Care Trusts on community care and children's services (Section 6);
- **Public safety**, in relation to additional activity by the Police Service of Northern Ireland and the Northern Ireland Fire and Rescue Service (Section 7);
- **Criminal justice**, in terms of additional work generated for the Northern Ireland Court Service and the Northern Ireland Prison Service (Section 8); and
- **Wider economic costs**, including the impact of alcohol misuse on factors such as unemployment and absenteeism (Section 9).

In common with standard practice for COI studies, we have based our cost analysis on the latest available annual data, rebased to 2008-09 prices for consistency.

3.6 Potential Health Benefits of Alcohol

While it is widely acknowledged that alcohol misuse can bring about a range of costs to society, a smaller body of published research also exists regarding the potential health benefits associated with drinking moderate amounts of alcohol in certain circumstances.

[7] Moore, T.J. and J.P Caulkins (2006), 'How Cost-of-Illness Studies Can Be Made More Useful for Illicit Drug Policy Analysis'

We have examined the evidence base on these potential benefits under a number of key themes:

- The level of alcohol consumption that could bring health benefits;
- The age and gender profile of individuals who may benefit from moderate alcohol consumption;
- The patterns of drinking that might bring an improvement in individuals' health; and
- The specific health benefits with which moderate alcohol consumption has been associated.

Consideration of the economic activity and tax revenues generated by the drinks industry was outside the scope of our brief.

3.6.1 Level of Consumption

A significant body of international academic literature indicates that light to moderate consumption of alcohol may be beneficial in terms of health. There are a range of definitions of what constitutes 'light to moderate' consumption across different countries:

Table 3.1: International Comparison of Recommendations on Alcohol Consumption

Country	Standard Unit of Alcohol	Daily Consumption Limit	
		Men	Women
UK	8g	3-4 units (24-32g)	2-3 units (16-24g)
Ireland	10g	3 units (30g)	2 units (20g)
United States	14g	1-2 units (14-28g)	1 unit (14g)
France	10g	3 units (30g)	3 units (30g)
Australia	10g	2 units (20g)	2 units (20g)

Source: International Center for Alcohol Policies, February 2010

Research undertaken by Alcohol Concern[8] suggests that people who abstain from alcohol are at a higher risk of mortality than light or moderate drinkers, and that heavy drinkers are at a higher risk than either of these groups. However, the authors acknowledge that a number of caveats arise in interpreting their analysis in a public health context. For example:

- Abstainers may include not only lifelong non-drinkers but also people who already have an increased mortality rate due to serious underlying health conditions and have been advised to refrain from drinking because of these. Therefore, it may not be appropriate to state that all abstainers would enjoy health benefits from increasing their alcohol consumption; and

[8] Alcohol Concern (2003), 'Alcohol and Mortality'

- The relationship between alcohol consumption and mortality can also vary with age. For example, while higher alcohol consumption can increase the risk of coronary heart disease and liver cirrhosis, these conditions make very little contribution to mortality rates among young adults, but may do so in later life. Increased drinking among young people may also increase their probability of being involved in any sort of accident.

Similarly, on the subject of abstainers, Fillmore, Stockwell et al[9] note that people decrease their consumption of alcohol as they age and may abstain from alcohol completely if they have to increase their use of medication. Therefore, if people in this group are at a higher risk of coronary heart disease, it is more likely to be due to their general ill health than their abstinence from alcohol.

Wannamethee and Shaper[10], however, suggest that both ex-drinkers and lifelong teetotallers have an increased prevalence of conditions likely to increase morbidity and mortality, compared to occasional or light drinkers.

In summary, Goldfinger[11] draws together a consistent body of research suggesting that heavy drinkers would be better off if they reduced their drinking or abstained completely, while abstainers and light drinkers would be best advised to avoid increasing their alcohol consumption significantly.

3.6.2 People Who May Benefit

As noted above, a substantial body of research indicates that a moderate intake of alcohol may have some beneficial health impacts. However, the international evidence base suggests these positive effects may not accrue equally to all consumers of alcohol, and in particular that people in middle age or later life may benefit more than younger people.

Anderson and Baumberg[12] report that alcohol consumption is estimated to delay up to 160,000 deaths per year in older people across the European Union, mainly through protecting the hearts of women who die after the age of 70.

Anstey, Mack *et al*[13] suggest that American alcohol drinkers in later life have a reduced risk of dementia; however, the authors note that it is unclear whether this reflects a protective effect of alcohol consumption throughout adulthood or a specific benefit of consuming alcohol in later life.

Britton, Marmot *et al*[14] found that any health benefits moderate drinking may bring in relation to heart disease do not arise equally in all drinkers, and recommended this variation should be emphasised in public health messages. The results of their study also indicated that, while those with the healthiest lifestyles enjoyed no additional health benefits from alcohol

[9] Filmore, K.M., T. Stockwell *et al* (2007), 'Moderate Alcohol Use and Reduced Mortality Risk: Systematic Error in Prospective Studies and New Hypotheses'
[10] Wannamethee, S.G. and A.G,. Shaper (1998), 'Alcohol, Coronary Heart Disease and Stroke: An Examination of the J-Shaped Curve'
[11] Goldfinger, T.M., (2003), 'Beyond the French Paradox: The Impact of Moderate Beverage Alcohol and Wine Consumption in the Prevention of Cardiovascular Disease'
[12] Anderson, P. and B. Baumberg (2006), 'Alcohol in Europe: A Public Health Perspective'
[13] Anstey, K.J., H.A. Mack *et al* (2009), 'Alcohol Consumption as a Risk Factor for Dementia and Cognitive Decline: Meta-Analysis of Prospective Studies'
[14] Britton, A., M.G. Marmot *et al* (2008), 'Who Benefits Most from the Cardioprotective Properties of Alcohol Consumption – Health Freaks or Couch Potatoes?'

consumption, people with poor health behaviours (e.g. little exercise, poor diet, smoking) experienced a significant heart protection benefit from moderate alcohol consumption, compared with complete abstinence or heavy drinking.

Addressing the impacts of moderate alcohol consumption, Doll[15] suggests that the optimum level of alcohol consumption will vary by gender and age, and no health benefits may arise from alcohol consumption in people below the age of 45.

In a study of Japanese men and women aged between 40 and 79, Lin, Kikuchi *et al*[16] found that consuming up to two drinks per day reduced their risk of mortality, although heavier drinking increased this risk. A 2007 study by Tolstrup and Gronbaek[17] supported the view that light to moderate alcohol intake has heart protection properties, and that this benefit is more pronounced among middle-aged and elderly people than among young adults.

Lee, Sudore *et al*[18] examined whether the suggested health benefits of moderate alcohol intake (compared to complete abstinence) remain after taking account of the levels of education, income and wealth of those surveyed. The study concluded that, while light drinkers generally have a higher socio-economic status than non-drinkers, health benefits still remain for moderate drinkers after adjusting for these factors.

In a study conducted among Dutch people aged 55 or over, Mattace-Raso, van der Cammen *et al*[19] found that moderate alcohol consumption is associated with lower levels of arterial stiffness in women, independently of cardiovascular risk factors and atherosclerosis.

Stampfer, Kang, Chen *et al*[20] carried out a study among people aged between 70 and 81, the results of which suggested that, for women, up to one drink per day does not impair cognitive function and may actually decrease the risk of cognitive decline. These findings were supported by research later undertaken by McGuire, Ajani, Ford *et al*[21].

3.6.3 Patterns of Consumption

The international research we reviewed for the study suggested that, while patterns of consumption may play a role in relation to realising the potential health benefits of alcohol, there is little evidence to suggest that the type of alcoholic beverage consumed has a meaningful impact on the health benefits generated.

From a study conducted in Italy, Augustin, Gallus *et al*[22] conclude that drinking alcohol during meals rather than outside meals can reduce the risk of acute myocardial infarction. Vogel[23]

[15] Doll, R. (1998), 'The Benefit of Alcohol in Moderation'
[16] Lin, Y., S. Kikuchi *et al* (2005), 'Alcohol Consumption and Mortality among Middle-Aged and Elderly Japanese Men and Women'
[17] Tolstrup, J. and M. Gronbaek (2007), 'Alcohol and Atherosclerosis: Recent Insights'
[18] Lee, S.J., R.L. Sudore *et al* (2009), 'Functional Limitations, Socioeconomic Status and All-Cause Mortality in Moderate Alcohol Drinkers'
[19] Mattace-Raso F.U., T.J. van der Cammen *et al* (2005), 'Moderate Alcohol Consumption is Associated with Reduced Arterial Stiffness in Older Adults: The Rotterdam Study'
[20] Stampfer, M.J., J.H. Kang, J. Chen *et al* (2005), 'Effects of Moderate Alcohol Consumption on Cognitive Function in Women'
[21] McGuire, L.C., U.A. Ajani, E.S. Ford *et al* (2007), 'Cognitive Functioning in Late Life: The Impact of Moderate Alcohol Intake.
[22] Augustin, L.S.A, S. Gallus *et al* (2004), 'Alcohol Consumption and Acute Myocardial Infarction: A Benefit of Alcohol Consumed with Meals?'
[23] Vogel, R.A. (2002), 'Alcohol, Heart Disease and Mortality: A Review'

also noted that the protective effects of alcohol on the heart are greater if alcohol is consumed with meals, and in moderate quantities rather than to excess.

Klatsky[24] notes that the international research base has not reached a settled view on whether drinking wine provides greater protection from coronary disease than beer or spirits, and suggests that the additional health benefits observed among wine drinkers may be related to more favourable alcohol intake patterns rather than the type of drinks they consume. This suggestion is also supported by studies undertaken by MEREC[25], Rehm, Sempos *et al*[26], Rimm, Klatsky *et al*[27], and TRIP[28].

3.6.4 Specific Health Benefits

Our analysis indicates that moderate alcohol intake, if consumed in an appropriate pattern, has the potential to generate health benefits for a range of groups in society, most notably people in middle and old age. These benefits relate largely to reducing the risk of heart disease, stroke, dementia and diabetes.

Alcohol Concern's research[29] indicates that alcohol can play a role in reducing the risk of heart disease and stroke. This view is also supported by studies undertaken by Di Castelnuovo, Costanzo *et al*[30], Dixon, Dixon *et al*[31], Kolovou, Salpea *et al*[32], McConnell, Vavouranakis *et al*[33], MEREC[34], Papadakis, Ganotakis *et al*[35], Rehm, Gmel *et al*[36], Rehm, Sempos *et al*[37], Elkind, Sciacca, Boden-Albala *et al*[38] and Wannamethee and Shaper[39]

Similarly, Criqui[40] asserts that consuming up to two drinks per day can help prevent cardiovascular disease, favourably influence thrombotic factors and reduce insulin resistance.

In a study from the United States, Kloner and Rezkalla[41] also suggest that light to moderate alcohol intake (fewer than 56g per day in men and fewer than 28g per day in women) can confer health benefits on the heart.

[24] Klatsky, A.L. (2007), 'Alcohol, Cardiovascular Diseases and Diabetes Mellitus'
[25] MEREC, *ibid*
[26] Rehm, J. C.T. Sempos *et al, ibid*
[27] Rimm, E.B., A. Klatsky *et al* (1996), 'Review of Moderate Alcohol Consumption and Reduced Risk of Coronary Heart Disease: Is the Effect Due to Beer, Wine or Spirits?'
[28] TRIP (2007), 'What is the Evidence behind the Recommended Alcohol Intake Figures?'
[29] Alcohol Concern, *ibid*
[30] Di Castelnuovo, A., S. Costanzo *et al* (2009), 'Alcohol Consumption and Cardiovascular Risk: Mechanisms of Action and Epidemiological Perspectives'
[31] Dixon, A.F., J.B. Dixon *et al* (2003), 'Cardiovascular Benefit of Light to Moderate Alcohol Consumption'
[32] Kolovou, G.D., K.D. Salpea *et al* (2006), 'Alcohol Use, Vascular Disease and Lipid-Lowering Drugs'
[33] McConnell, M.V., I. Vavouranakis *et al* (1997), 'Effects of a Single Daily Alcoholic Beverage on Lipid and Hemostatic Markers of Cardiovascular Risk'
[34] MEREC (2002), 'Lifestyle Measures to Reduce Cardiovascular Risk'
[35] Papdakis, J.A., E.S. Ganotakis *et al* (2000), 'Beneficial Effect of Moderate Alcohol Consumption on Vascular Disease: Myth or Reality?'
[36] Rehm, J., G. Gmel *et al* (2003), 'Alcohol-Related Morbidity and Mortality'
[37] Rehm, J., C.T. Sempos *et al* (2003), 'Alcohol and Cardiovascular Disease – More than One Paradox to Consider. Average Volume of Alcohol Consumption, Patterns of Drinking and Risk of Coronary Heart Disease – A Review'
[38] Elkind M.S., R. Sciacca, B. Boden-Albala *et al* (2006), 'Moderate Alcohol Consumption Reduces Risk of Ischemic Stroke: The Northern Manhattan Study'
[39] Wannamethee, S.G. and A.G,. Shaper, *ibid*'
[40] Criqui, M.H. (1998), 'Do Known Cardiovascular Risk Factors Mediate the Effect of Alcohol on Cardiovascular Disease?'

A study by Meier and Seitz[42] noted a protective health effect of regular alcohol consumption in relation to coronary heart disease and stroke, which was more pronounced in elderly people and in individuals with additional risk factors for coronary heart disease.

Research by Djoussé and Gaziano[43] suggests that, in people with coronary artery disease, the consumption of moderate quantities of alcohol may lower the risk of heart failure.

However, Bau, Bau *et al*[44] state that, while alcohol can have some protective effects on cardiovascular health due to its ethanol content, there is insufficient evidence to justify recommending that non-drinkers consume some alcohol to enjoy these benefits, due to the other negative impacts alcohol can have.

In reviewing the impact of alcohol intake on coronary heart disease, Corrao, Bagnardi *et al*[45] also note that moderate alcohol consumption could have significant protective effects, but that excessive consumption carried a substantially increased risk of disease.

As well as the heart, the international evidence base suggests that moderate alcohol consumption can bring health benefits in a number of other areas, such as blood flow, dementia and diabetes.

A study by Suter, Murabito, Felson *et al*[46] supported the possibility that moderate consumption of red wine may help protect against Raynaud's Phenomenon, a condition affecting the flow of blood to the fingers, toes and other extremities.

An investigation by Peters[47] indicated that small amounts of alcohol consumption may help protect people aged over 65 against unspecified incident dementia and Alzheimer's Disease but not against vascular dementia or cognitive decline.

In their 1999 research, Valmadrid, Klein *et al*[48] suggested that moderate alcohol consumption could have an overall beneficial effect in decreasing the risk of death from coronary heart disease among people with older-onset diabetes.

Following a similar line of inquiry, a study by Zilkens and Puddey[49] indicated that long-term exposure to light to moderate amounts of alcohol for people with Type 2 diabetes can bring an improvement in insulin sensitivity, as well as helping protect them against coronary artery disease. This research also suggested that a light to moderate alcohol intake over time could play a protective role against the development of diabetes itself.

[41] Kloner, R.A. and S.H. Rezkalla (2007), 'To Drink or Not to Drink? That is the Question'
[42] Meier, P. and H.K. Seitz (2006), 'Effects of Alcohol: Besides its Harmful Health Impact, Are There Any Positive Aspects of Chronic Alcohol Consumption?'
[43] Djoussé, L. and J.M. Gaziano (2007), 'Alcohol Consumption and Risk of Heart Failure in the Physicians' Health Study'
[44] Bau, P.F.D., C.H.D Bau *et al* (2007), 'Alcohol Consumption, Cardiovascular Health and Endothelial Function Markers'
[45] Corrao, G., V. Bagnardi *et al* (2004), 'A Meta-Analysis of Alcohol Consumption and the Risk of 15 Diseases'
[46] Suter, L.G., J.M. Murabito, D.T. Felson *et al* (2007), 'Smoking, Alcohol Consumption and Raynaud's Phenomenon in Middle Age'
[47] Peters, R. (2008), 'Alcohol, Dementia and Cognitive Decline in the Elderly: A Systematic Review'
[48] Valmadrid, C.T., R. Klein *et al* (1999), 'Alcohol Intake and the Risk of Coronary Heart Disease Mortality in Persons with Older-Onset Diabetes Mellitus'
[49] Zilkens, R.R. and I.B. Puddey (2003), 'Alcohol and Cardiovascular Disease – More than One Paradox to Consider. Alcohol and Type 2 Diabetes – Another Paradox?'

3.6.5 Summary of Potential Health Benefits

In summary, the international research base regarding alcohol consumption indicates that:

- Light to moderate consumption may bring some health benefits to certain population groups, but excessive consumption increases risks to health. Definitions of low-risk consumption levels vary between countries, but in a UK context, this would equate to 24-32g of alcohol per day for men and 16-24g per day for women;
- Older people may enjoy greater health benefits from light to moderate alcohol consumption than younger people, particularly for those aged over 45;
- Drinking alcohol with meals may confer a greater level of benefit than drinking at other times, but there is little firm evidence that certain types of alcoholic drinks (i.e. wine, beer or spirits) are more beneficial than others; and
- The principal health benefits of moderate alcohol consumption relate to conditions such as heart disease and stroke.

Due to the limited data available, it has not been possible to quantify the financial impact of these benefits within the study.

4 DATA SOURCING AND ANALYSIS

4.1 Introduction

To make the study as robust as possible and develop a detailed estimate of the cost of alcohol misuse in Northern Ireland, we considered and analysed data available from a wide variety of sources, covering a broad spectrum of themes.

4.2 Data Sources

In light of the review's importance in informing the users of the social costs of alcohol misuse in Northern Ireland, we sought to base our work on a body of evidence which was as robust as possible and would stand up to detailed scrutiny.

4.2.1 Approach to Data Quality

For our work on the assignment, we took cognisance of a range of factors in ensuring the robustness of the data we used, including:

- **Timeliness:** The lapse of time between publication and the period to which the data refer and the present day;
- **Accessibility:** The format in which the data are available and the availability of supporting information; and
- **Comparability:** The degree to which data sourced inside and outside Northern Ireland can be compared.

We based our assessment of potential data sources on the criteria above, and developed a three-stage approach to gathering the data we required for the review, as detailed below:

4.2.2 Stage 1 – Published Government Information

To maximise the robustness of our evidence base, we have made as much use as possible of information published officially by Government Departments and Agencies, as this is likely to have gone through a rigorous process of quality assurance before entering the public domain.

Equally, data that have been subjected to peer review are generally considered robust and are often contained in highly regarded research publications.

Our first step in sourcing the data we need for the estimates in the review was therefore to undertake comprehensive online searches to gather as much relevant information for the study as possible from official Government publications and academic research papers.

4.2.3 Stage 2 – Unpublished Government Information

In addition to the reports and other documents they publish, Government Departments and Agencies also produce and collate a wide range of other data which are not widely disseminated.

After our review of published Government data, we identified a number of themes within the study where public data were not available or additional clarification was required to further analyse the public data we sourced.

The second stage of sourcing the data we use in our estimates was therefore to approach Government Departments and Agencies directly, to request any additional data required to complement and clarify the publicly available information we gathered earlier in the process.

4.2.4 Stage 3 – Estimates Derived from Other Sources

In any parts of the study where we were unable to access the quantity or quality of information we required from within Northern Ireland's public services or other reliable sources, it was necessary for us to make carefully thought out assumptions on the costs arising in these areas (for example, drawing on similar studies recently undertaken in Scotland and England).

Any cost estimates we derive in this way were subject to a higher degree of uncertainty and specifically identified as such within our stratified framework for analysis and reporting.

4.2.5 Data Risks and Mitigation Strategy

At the outset of our work, we carried out an initial assessment of the key risks we anticipated we would experience in relation to accessing data for the assignment. We then put in place robust strategies to mitigate the potential impacts of these risks as our work progressed.

Table 4.1 below sets out the risks we identified and the steps we took to mitigate them:

Table 4.1: Data Risks Initially Identified and Mitigation Strategy

RISK	INITIAL ASSESSMENT		MITIGATION STRATEGY EMPLOYED
	Published Government Data	Unpublished Government Data	
Information will not be complete	**Medium risk** While Government publishes a significant volume of data, it is likely that we will need clarification of this or additional data in order to meet our information requirements in full	**Medium risk** Even after sourcing any additional unpublished information in certain areas, it is likely that we will need to add to this or explore it further in taking our analysis forward	During the information gathering phase of our work, we reviewed all information for completeness as soon as we received it. This allowed as much time as possible within the project timeframe to identify and address any gaps in information
Information will not be accurate	**Low risk** Information which has been officially published by the Government will have gone through a rigorous process of quality assurance before issue	**Medium risk** Government information which is intended for internal use rather than publication will not have undergone the same level of review as published information	After we received any data we had requested, we reviewed, clarified and 'sense-checked' it in detail before bringing it into our analysis. This was particularly relevant for unpublished data
Information requested will not be provided in a timely fashion	**Low risk** Information which has been officially published by the Government should be readily available as and when required	**Medium risk** If information is intended only for internal Government use rather than publication, it may take longer to gain access to it for the study	Where we required access to unpublished Government data from Departments other than DHSSPS (to complement or drill further into published information), we prepared detailed written information requests and considered the benefits of issuing them in DHSSPS's name with their prior agreement

RISK	INITIAL ASSESSMENT		MITIGATION STRATEGY EMPLOYED
	Published Government Data	Unpublished Government Data	
Information will not be provided in a useable format	**Low risk** The presentation and format of published Government information will have been fully reviewed before it is placed in the public domain	**Medium risk** The format of unpublished Government information is likely to be designed for internal purposes only, and not for use by third parties	In the requests we made (through DHSSPS) for unpublished data, we clearly specified the information we required and the preferred format for its provision
Information will not be available in the Northern Ireland context	**Medium risk** While a wide range of data is published for Northern Ireland, it is possible that some data used for similar studies elsewhere in the UK is not available in Northern Ireland	**Medium risk** While Government in Northern Ireland produces a variety of information which is not published for Northern Ireland, it is possible that some data used for similar studies elsewhere in the UK is not available in Northern Ireland, even in unpublished form	If data were not available for Northern Ireland, we developed assumptions on the cost elements in question, drawing on recent similar studies in Scotland and England

In addition, organisations which provided source data for use in the study were provided with the opportunity to provide feedback on the analysis we undertook. These comments have been reflected in the report where appropriate.

4.3 Principles for Analysis

It is important to note that specific data are not available in Northern Ireland for a number of the areas covered in the review.

In the light of the constraints on information available, we have therefore made a range of pragmatic assumptions in working with the data at our disposal.

Our cost estimates in the study have been developed using two main principles:

- Estimating activity levels and applying unit costs to these (e.g. acute hospital bed days for conditions associated with alcohol misuse); and
- Estimating a relevant proportion of the total expenditure on a specific aspect of service provision (e.g. proportion of fire service expenditure in responding to alcohol-related incidents).

The estimates developed for the study contain an inherent degree of uncertainty and the costs generated from our work should therefore be considered as indicative.

4.4 Stratification of Cost Estimates

In developing and presenting our overall estimate of the total cost of alcohol misuse, we have categorised our analysis of individual cost elements into either:

- **Firm estimates,** where we have been able to obtain robust, recent source data for the Northern Ireland context from Government Departments and Agencies; or
- **Outline estimates**, covering areas of our analysis which have been subject to greater levels of uncertainty (for example, where the data available for Northern Ireland is a number of years old, or where we have had to make significant assumptions in developing the cost estimates, using data sourced from Scotland or England).

For each of the above estimates, we have set out:

- Our **base case,** representing the firm or outline estimates calculated on the basis detailed above; and
- The results of our **sensitivity analysis,** examining the impact of variations in key assumptions underpinning our estimates.

In performing our sensitivity analysis, we have taken into account the results of a number of recent studies of the social costs of alcohol misuse, as well as the potential impact of more general variations in costs.

The detailed steps we have performed in developing each individual cost estimate are set out in full in the relevant sections of the report.

In areas of the study where we have been able to base our analysis on specific information furnished by data providers, we have categorised our cost estimates as firm, and applied a general sensitivity of +/-10% in our analysis. As an example, our estimate for the cost of acute hospitalisation days associated with alcohol misuse (Section 5.5) has been developed using specific source information from DHSSPS, and we have therefore categorised the estimate as firm.

For other areas of the study, where we have been able to develop only outline estimates, we have followed two key principles in performing sensitivity analysis:

- Where other recent studies have contained a range of estimates (e.g. on the proportion of specific cost elements relating to alcohol misuse), we have reflected these variations in our sensitivity analysis; and
- For other outline estimates, we have applied a wider general sensitivity of +/-25% to reflect a higher level of inherent uncertainty.

For example, a number of recent studies elsewhere in the UK have sought to identify the proportion of Accident and Emergency (A&E) attendances associated with alcohol misuse (Section 5.7), and have produced estimates as diverse as 2%, 25% and 45%. In this area of

the study, we have therefore used a proportion of 25% in developing our base case, and adopted proportions of 2% and 45% in our sensitivity analysis.

In contrast, for our analysis of the proportion of court costs connected to alcohol-related crime (Section 8.2), we have instead applied a general sensitivity of +/-25% around the base-case estimate developed using evidence from Scotland, in the absence of other reliable data.

This approach was intended to ensure our analysis was as robust and evidence-based as possible, while recognising that cost estimates in a number of areas may be subject to a degree of uncertainty.

4.5 Comparison of Adult Drinking Patterns in the UK

In developing estimates for the social costs of alcohol misuse in Northern Ireland, we have sought to draw on the results and assumptions of other similar studies conducted recently in both Scotland and in England.

To provide context to the comparisons we have made, the table below presents summary details of current adult drinking patterns in Northern Ireland, England, Scotland and Wales, in relation to the prevalence, frequency and level of alcohol consumption, as well as mortality rates associated with alcohol misuse.

As described in the accompanying narrative, there are a number of technical differences in the definitions used for reporting the data for Northern Ireland and Great Britain. Our analysis should therefore be viewed as a high-level review of drinking patterns across the four jurisdictions, rather than an exact comparison.

Table 4.2: Adult Drinking Patterns in Northern Ireland, England, Scotland and Wales

	Northern Ireland	England	Scotland	Wales	*Great Britain*
Daily drinking					
Adults who drank alcohol at least once in the past week (%)	**52**	63	56	57	*62*
Adults who drank alcohol on five or more days in past week (%)	**6**	15	11	13	*15*
Adults exceeding recommended daily limit at least once in past week (%)	**42**	33	31	30	*33*
Adults exceeding twice recommended daily limit at least once in past week (%)	**23**	18	16	14	*18*
Weekly drinking					
Average units consumed per week					
Males	**18.6**	n/a	18	n/a	*n/a*
Females	**11.6**	n/a	8.6	n/a	*n/a*

	Northern Ireland	England	Scotland	Wales	*Great Britain*
Adults who drank above hazardous weekly limits in average week (%)	**12**	n/a	25	n/a	*n/a*
Adults who drank above harmful weekly limits in average week (%)	**3**	n/a	18	n/a	*n/a*
Alcohol-related death rate per 100,000 population					
Males	**21.5**	15	39.3	16.5	*17.4*
Females	**9.3**	7.2	15.8	8.1	*8.1*

Sources: DHSSPS Adult Drinking Patterns Survey and ONS General Lifestyle Survey

4.5.1 Prevalence of Alcohol Consumption

Data from a 2008 DHSSPS survey[50] suggest that some 52% of adults in Northern Ireland who completed a drinking diary had consumed alcohol at least once in the last week. This may suggest that a lower proportion of adults consume alcohol each week in Northern Ireland than in England (63%), Scotland (56%) or Wales (57%)[51].

The results of the survey also showed that 6% of all adults in Northern Ireland consumed alcohol either every day or most days. This result is considerably lower than the proportions of adults reported as having consumed alcohol on five or more days in the past week in England (15%), Scotland (11%) and Wales (13%).

The analysis above suggests that fewer adults in Northern Ireland consume alcohol, and do so less frequently, than in Great Britain.

4.5.2 Frequency of Excessive Alcohol Consumption

The current recommended daily drinking limits state that drinking four or more units of alcohol a day for males and three or more units a day for females will increase alcohol-related health risks. These limits are now expressed in terms of consumption per day rather than per week, partly because of Government concerns about the health and social risks associated with single episodes of intoxication and binge drinking.

Data supplied to us by DHSSPS indicate that, of adults who completed a drinking diary, 42% consumed more than their recommended limit on at least one day in the course of the past week. This is a greater proportion than reported by the 2008 General Lifestyle Survey for England (33%), Scotland (31%) and Wales (30%).

Data for Northern Ireland also suggest that, of adults who completed a drinking diary, 23% consumed more than twice their recommended limit on at least one day in the course of the past week, again higher than in England (18%), Scotland (16%) and Wales (14%).

[50] DHSSPS, 'Adult Drinking Patterns in Northern Ireland 2008'
[51] ONS, General Lifestyle Survey, 2008 (Table 2.21)

The analysis above would indicate that the proportion of adults in Northern Ireland who drink in excess of their daily recommended limits in the course of any given week is higher than in England, Scotland and Wales.

4.5.3 Extent of Excessive Alcohol Consumption

Data supplied by DHSSPS state that, while the average number of units consumed each week is comparable for men in Northern Ireland and Scotland, average weekly alcohol consumption is slightly higher for women in Northern Ireland than in Scotland (as reported in the Scottish Health Survey 2008).

To help assess the extent of problem drinking in Northern Ireland relative to Scotland, we have also examined reported levels of:

- **Hazardous drinking** (defined as above 21 units per week for men and above 14 units per week for women); and
- **Harmful drinking** (defined as above 50 units per week for men and above 35 units per week for women).

DHSSPS data suggest that the proportions of adults exceeding hazardous and harmful levels of weekly drinking in Northern Ireland are around half those reported in Scotland.

Therefore, while our analysis in preceding sections notes that daily consumption limits are exceeded more frequently in Northern Ireland, 'problem drinking' here is less pronounced when assessed on a weekly rather than daily basis.

4.5.4 Alcohol-Related Mortality Rates

Data supplied to us by the Northern Ireland Statistics and Research Agency (NISRA) indicate that the average alcohol-related death rates between 2006-08 in Northern Ireland for both males and females were slightly higher than in the latest country-by-country data published by ONS in 2007 (average for 2002-04) for England, Wales and Great Britain as a whole, but considerably lower than in Scotland.

A subsequent UK-wide study by ONS[52] suggested that, while trends in alcohol-related deaths were levelling out, mortality rates associated with alcohol were slightly higher for men and women in 2007 than in 2004.

4.5.5 Summary of Comparisons by Jurisdiction

The analysis in earlier sections suggests that alcohol consumption in Northern Ireland is currently less prevalent and less frequent than in Great Britain, and that, while daily consumption limits are exceeded more often in Northern Ireland than elsewhere in the UK, weekly consumption limits are breached less often in Northern Ireland than in other jurisdictions.

[52] ONS, 'News Release: Trend in alcohol-related deaths levelling out', January 2009

In summary, the results above suggest that:

- Compared to **England and Great Britain** as a whole, fewer adults in Northern Ireland consume alcohol each week, and do so less frequently over the course of a week. However, a higher proportion of adults in Northern Ireland exceed their recommended daily limits over the course of a week, and alcohol-related death rates here are above those for England and Great Britain, for both males and females;
- Relative to **Scotland**, slightly fewer adults in Northern Ireland drink alcohol in a typical week, and again do so less frequently. Nonetheless, a greater proportion of adults again exceed their recommended daily limits over the course of a week. Average alcohol consumption per week is comparable for males in the two jurisdictions but slightly higher for females in Northern Ireland than in Scotland. However, the reported incidence of weekly hazardous and harmful drinking (as defined in Section 4.3.3) is much lower in Northern Ireland than in Scotland. Alcohol-related death rates are also considerably lower in Northern Ireland than in Scotland, for males and females; and
- In comparison to **Wales**, fewer adults in Northern Ireland consume alcohol in a typical week and do so less often over the course of a week. Once more, a higher proportion of adults in Northern Ireland exceed their recommended daily limits over the course of a week, and alcohol-related death rates in Northern Ireland are above those in Wales, for both males and females.

4.5.6 Comparability of Northern Ireland to Other Jurisdictions

The analysis above produces differing results regarding the patterns of daily and weekly alcohol consumption in Northern Ireland relative to England, Scotland and Wales. This is a key part of assessing the overall extent of problem drinking and alcohol misuse in Northern Ireland.

Our work suggests that:

- Fewer adults regularly consume alcohol in Northern Ireland than in Great Britain;
- Compared to Great Britain, a greater proportion of adults exceed their recommended daily limits at least once a week; and
- Relative to Scotland, a lower percentage of adults consume hazardous or harmful quantities of alcohol over the course of a week.

This in turn presents challenges in identifying the overall extent of alcohol misuse in Northern Ireland relative to England, Scotland and Wales and interpreting the applicability of previous studies in Great Britain within the context of Northern Ireland.

Differences of opinion exist regarding whether problem drinking should be defined on a daily or a weekly basis.

Official Government guidelines on alcohol consumption are expressed in terms of units per day, to discourage binge drinking on any individual day. On this measure, problem drinking would appear more prevalent in Northern Ireland than England, Scotland or Wales.

However, many academic and professional commentators have asserted a weekly consumption limit would be more appropriate, rather than imply that it is safe to drink the maximum daily recommended limit of alcohol every day. Using this approach, problem drinking in Northern Ireland would seem less severe than in Scotland.

Paradoxically, our analysis suggests that problem drinking is comparatively more of an issue in Northern Ireland than other jurisdictions when measured against daily limits, but is of lesser magnitude when judged on a weekly basis.

The evidence base is therefore mixed and is not sufficiently strong overall to suggest that problem drinking is any more or less of an issue in Northern Ireland than the rest of the UK. We have taken account of this in assessing the applicability of recent similar studies in Scotland and England which is discussed further below.

4.6 Comparison between Northern Ireland and Scotland

A number of detailed studies of the social costs of alcohol have been published by the Scottish Government in recent years. As agreed with DHSSPS, we have therefore used Scotland as a key point of reference and source of evidence in developing the analysis in this report (for example, in areas where specific data are not available within Northern Ireland).

4.6.1 Prevalence Rates

Our analysis above indicates that, compared to Scotland, slightly fewer adults in Northern Ireland consume alcohol each week and do so less frequently during the course of a week.

4.6.2 Level of Consumption

The reported proportion of adults exceeding their recommended daily limits on at least one day in the past week is higher in Northern Ireland than in Scotland, as is the proportion of adults in Northern Ireland who exceed twice their recommended daily limits on at least one day in the past week.

Assessing consumption patterns on the basis of daily intake, this would suggest that the extent of problem drinking is greater in Northern Ireland than in Scotland. However, a different picture emerges when drinking patterns over the course of a week are considered.

Average units consumed per week are comparable for adult males in Northern Ireland and Scotland but higher for adult females in Northern Ireland than in Scotland. However, the reported extent of both ‘hazardous’ and ‘harmful’ drinking in an average week in Scotland is markedly higher than in Northern Ireland.

While evidence is therefore mixed as to the comparative extent of problem drinking in Northern Ireland and Scotland (depending on whether consumption is considered in daily or weekly terms), our work suggests that the seriousness of harm caused by excessive drinking may be higher in Scotland than in Northern Ireland when considered on a weekly basis rather than just on a daily analysis.

4.6.3 Mortality Rates

The 2008 reported rate of alcohol-related deaths per 100,000 of population is around two-thirds higher in Scotland than in Northern Ireland.

Table 4.3 below presents alcohol-related death rates in Northern Ireland and Scotland between 2001 and 2008, and suggests that, while there is a substantial difference in alcohol-related death rates between the two countries, the gap has narrowed slightly in recent years.

Table 4.3: Alcohol-Related Death Rates – Northern Ireland and Scotland, 2001-08

Alcohol-related deaths per 100,000 of population	2001	2002	2003	2004	2005	2006	2007	2008
Northern Ireland	12.2	14.0	12.6	14.9	14.3	14.2	16.1	15.5
Scotland	27.6	29.4	30.2	29.1	29.7	30.2	27.2	27.3

Source: FGS McClure Watters, NISRA and General Register Office of Scotland

This is consistent with the assertion that the degree of harm caused by alcohol misuse is still at this time greater in Scotland than in Northern Ireland.

4.6.4 Morbidity Rates

Another way of looking at the degree of harm caused by excessive alcohol consumption is to consider morbidity rates for conditions associated with alcohol misuse.

As a proxy for this, we have examined the number of acute hospital bed days in Northern Ireland and Scotland for conditions classified as wholly attributable to alcohol misuse under the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10).

For the 2007-08 year, data supplied by DHSSPS indicate that a total of 11,899 acute hospital inpatient episodes arose in Northern Ireland for conditions wholly attributable to alcohol. ICD codes relating to alcohol misuse were searched for in any of the seven separate diagnostic fields in the DHSSPS Hospital Inpatient System to derive the number of bed days arising, rather than examining the primary diagnosis alone. Across Northern Ireland's 2007 mid-year population estimate of 1.76 million, this would represent 676 such episodes per 100,000 of population.

On the same basis, a study published by the Scottish Government in 2010 stated that 42,639 acute hospital episodes occurred in Scotland in 2007-08 for conditions wholly attributable to alcohol. On a per-capita basis, across Scotland's 2007 mid-year population of 5.1 million, this corresponds to some 829 alcohol-related episodes per 100,000 of population.

Our analysis of morbidity rates associated with alcohol again supports the argument that the degree of harm caused by alcohol misuse is higher in Scotland than in Northern Ireland.

4.6.5 Conclusion

Comparing the patterns and consequences of alcohol misuse in Northern Ireland and Scotland produces mixed and occasionally contradictory results.

Judged against UK-wide Government policy on daily consumption limits, alcohol misuse would appear to be more widespread in Northern Ireland than in Scotland.

Reported average weekly consumption levels are also marginally higher in Northern Ireland than in Scotland.

In contrast, when assessed on a weekly basis (in conflict with current Government policy), hazardous and harmful drinking levels are much more widespread in Scotland than in Northern Ireland. Mortality and morbidity rates associated with alcohol misuse are also higher in Scotland than in Northern Ireland. Both these factors support the assertion that alcohol misuse appears to cause greater harm in Scotland than in Northern Ireland.

On the basis of the mixed evidence available, it is therefore not possible to reach a strong conclusion on the relative impacts of alcohol misuse in Northern Ireland and Scotland.

To account for this, in areas of the study where we have developed assumptions based on evidence from Scotland, we have included a notional 10% reduction factor for Northern Ireland, to reflect potential differences in the degree of harm caused by alcohol misuse in the two jurisdictions.

While we fully recognise that it is not possible to provide any scientific basis for such a reduction factor, we believe it is a fair reflection of the facts available to the research team. In addition, within our cost summaries, we have also presented the results produced by applying evidence from Scotland directly to Northern Ireland, without any adjustment.

5 COST ANALYSIS – HEALTHCARE

5.1 Introduction

This section of the report examines the additional costs which are borne by the health service in Northern Ireland as a result of alcohol misuse.

Table 5.1 below sets out the cost elements we have considered within this theme, consistent with the areas addressed in other recent studies of the costs of alcohol misuse, and provides cross-references to our detailed work on each cost element later in the section:

Table 5.1: Alcohol-Related Cost Elements in Healthcare

Cost Element	Section
GP-prescribed drugs	5.2
GP/practice nurse consultations attributable to alcohol	5.3
Laboratory testing in primary care	5.4
Hospitalisation days – acute	5.5
Hospitalisation days – mental illness	5.6
Accident and Emergency attendances	5.7
Outpatient hospital visits	5.8
Day hospital visits – mental illness	5.9
Day hospital visits – non-mental illness	5.10
Community psychiatric teams	5.11
Health promotion	5.12
Drug and Alcohol Coordination Teams	5.13
Ambulance journeys	5.14

5.2 GP-Prescribed Drugs

5.2.1 Description

The two drugs that are mainly used to treat alcohol dependency are Acamprosate (also known as Campral) and Disulfiram (also known as Antabuse). Disulfiram is prescribed to create a physical aversion to alcohol use and Acamprosate is prescribed to post-abstinence patients to reduce alcohol cravings.

Expenditure on these drugs represents part of the cost of alcohol misuse to the health service in Northern Ireland.

The Scottish Government's 2010 study of the costs of alcohol misuse also considered prescription costs in respect of Naltrexone Hydrochloride, a substance used to treat both alcohol and drug dependence. However, no data were available for Northern Ireland in relation to the costs associated with this for the study. For consistency with other studies, we have also excluded the use of Chlordiazepoxide from our analysis as it is mainly used for conditions other than those associated with alcohol misuse.

5.2.2 Methodology for Calculation

As in previous studies in Scotland and England, we have sought to identify the net ingredient cost of Acamprosate and Disulfiram as an element of the social costs of alcohol misuse.

In line with previous analyses, and for consistency with other recent UK studies in this field, we have taken account of drug ingredient costs but excluded both prescription fees paid by patients and any additional dispensing costs incurred by pharmacists.

5.2.3 Data Sources Used

The HSC Business Services Organisation (BSO) provided us with specific information on the net ingredient cost of Disulfiram and Acamprosate dispensed for the 2008 calendar year.

5.2.4 Estimate of Alcohol-Related Cost

Based on the information provided by the BSO, expenditure in the 2008 calendar year on Disulfiram was £80,878 with a further £197,371 spent on Acamprosate, a total of £278,249.

Uplifting this figure by the GDP deflator (2.52%) to reflect 2008-09 prices, we therefore estimate that drugs prescribed for alcohol dependency cost the health service some **£0.3m** a year.

5.2.5 Stratification and Sensitivity Analysis

As this estimate is based on specific data provided by BSO, we have stratified it as **firm** and applied a small margin of error of +/-10% in our sensitivity analysis, to produce a lower estimate of **£257,000** and a higher estimate of **£314,000**.

5.3 GP and Practice Nurse Consultations Attributable to Alcohol

5.3.1 Description

As well as the cost of drugs used in treating alcohol dependency, it is necessary to consider the costs associated with consultations for prescribing the drugs and monitoring their use.

5.3.2 Methodology for Calculation

We sought information from the BSO on the number of GP and practice nurse consultations wholly and partly attributable to alcohol in Northern Ireland. However, we understand the BSO does not gather or collate information of this nature.

5.3.3 Data Sources Used

In view of the limitations on data noted above, we have instead made broad estimates of the costs of GP and practice nurse consultations relating to alcohol, based on the relationships observed in other similar studies in Scotland and England.

In particular, we have examined the relationship between the cost of drugs prescribed for alcohol dependency in Scotland and England and the cost of consultations relating to alcohol in both those countries.

We have made use of the specific information provided by BSO on drug costs in developing our cost estimates in this area, and sought to examine the ratio of consultation costs to drug costs in Scotland and England, in order to develop a comparable estimate in Northern Ireland.

The latest estimates of the cost of alcohol misuse in Scotland and England contain the following relevant cost elements:

Table 5.2: GP and Practice Nurse Consultations in Scotland and England

Cost Element	SCOTLAND Annual Cost £m	ENGLAND Annual Cost £m
GP-prescribed drugs	0.87	2.14
GP/practice nurse consultations attributable to alcohol	15.1	111.6
Ratio of consultations cost to drugs cost	**17:1**	**52:1**

Source: Scottish Government and English Department of Health

The analysis above indicates that the cost of GP and practice nurse consultations is between 17 and 52 times greater than the cost of drugs prescribed for alcohol dependency in Scotland and England. This is a wide range of variation and highlights the challenges in making cost estimates in this area.

5.3.4 Estimate of Alcohol-Related Cost

For Northern Ireland, we have sought to estimate the cost of GP and practice nurse consultations relating to alcohol by:

- Identifying the specific cost of alcohol-related drugs;
- Examining the ratio of consultation costs to drugs costs, taking the midpoint of the English and Scottish estimates above; and
- Combining the figures above to produce an estimate of the cost of consultations.

As noted above, based on information supplied by the BSO for 2008, the cost of drugs prescribed for alcohol dependency in Northern Ireland was around £0.3m. However, based on the evidence available to us, there is a high degree of potential variability for this figure and we have conducted detailed sensitivity analysis below.

Analysis prepared in Scotland and England suggests the cost of GP and practice nurse consultations relating to alcohol is between 17 and 52 times the cost of drugs prescribed for alcohol dependency. Taking the midpoint of the figures for Scotland and England, we have therefore assumed that the cost of GP and practice nurse consultations relating to alcohol is 34.5 times the cost of alcohol-dependency drugs prescribed in Northern Ireland (estimated at £0.3m above), or £10.4m at 2008-09 prices.

Applying a notional 10% reduction to reflect the degree of harm caused by alcohol misuse in Northern Ireland (see section 4.6.5), our base case estimate of the annual alcohol-related costs in this area is therefore **£9.3m**, at 2008-09 prices.

5.3.5 Stratification and Sensitivity Analysis

We have had to make a number of assumptions in deriving our cost estimates for GP and practice nurse consultations and the figures reported should therefore be viewed only as **outline** estimates.

Previous studies have shown a wide degree of variation in terms of the relationship between GP consultations and drugs prescribed for alcohol misuse, and we have taken account of these in developing our sensitivity analysis around our base case estimate for these costs.

Our base case estimate assumes that the cost of GP and practice nurse consultations relating to alcohol is 34.5 times the cost of alcohol-dependency drugs prescribed. Previous studies in Scotland and England have suggested that this ratio lies between 17 and 52. Therefore:

- As our lower estimate, assuming a ratio of 17:1 between the cost of consultations and alcohol-related drugs prescribed would produce an annual cost of **£4.6m;** and
- As our higher estimate, assuming a ratio of 52:1 in this area would yield an annual cost of some **£14.0m.**

5.4 Laboratory Testing in Primary Care

5.4.1 Description

The 2010 study conducted in Scotland assumed that 25% of GP or practice nurse consultations relating to alcohol will require both a biochemistry test (relating to liver function) and a haematology test (relating to mean corpuscular volume).

In the absence of specific data or other evidence for Northern Ireland, we have adopted the same assumption in this review.

Conducting these tests will lead to additional costs being incurred within the health service in Northern Ireland.

5.4.2 Methodology for Calculation

We sought information from the BSO on the number of primary care laboratory tests wholly and partly attributable to alcohol in Northern Ireland. However, we understand the BSO does not gather or collate information of this nature.

5.4.3 Data Sources Used

In view of the limitations on data noted above, we have again made a broad estimate of the costs of primary care laboratory tests relating to alcohol, based on the relationships observed in other similar studies in Scotland.

In particular, we have examined the relationship between the cost of drugs prescribed for alcohol dependency and the cost of laboratory tests in Scotland. The most recent study in England did not contain comparable information in this area.

We have made use of the specific information provided by BSO on drug costs in developing our cost estimates in this area, and sought to examine the ratio of laboratory test costs to drug costs in Scotland, in order to develop a comparable estimate in Northern Ireland.

Table 5.3: Primary Care Laboratory Tests in Scotland

Cost Element	Annual Cost £m
GP-prescribed drugs	0.9
Primary care laboratory tests	0.2
Ratio of laboratory test cost to drugs cost	**0.22:1**

Source: FGS McClure Watters and Scottish Government

The above analysis indicates that the cost of alcohol-related laboratory tests in primary care is 0.22 times the cost of alcohol-related drugs dispensed in Scotland. We have therefore used this ratio in estimating the cost of laboratory testing in primary care for Northern Ireland.

5.4.4 Estimate of Alcohol-Related Cost

As noted above, based on information supplied by the BSO for 2008, the cost of drugs prescribed for alcohol dependency in Northern Ireland was around £0.3m.

Analysis prepared in Scotland suggests the cost of primary care laboratory tests relating to alcohol is 0.22 times the cost of drugs prescribed for alcohol dependency, or £0.07m at 2008-09 prices.

Applying a notional 10% reduction to reflect the Northern Ireland context, our base case estimate at 2008-09 prices of the annual alcohol-related costs of laboratory tests in primary care is therefore **£0.06m.**

5.4.5 Stratification and Sensitivity Analysis

We have stratified this cost estimate as **outline** since it has been developed using a range of assumptions. In our sensitivity analysis, we have applied a potential margin of error of +/-25% in generating lower and higher estimates around the base case. This produces:

- A lower estimate of **£0.05m;** and
- A higher estimate of **£0.08m.**

5.5 Hospitalisation Days – Acute

5.5.1 Description

An important element of the overall social cost of alcohol misuse in Northern Ireland is the cost of acute hospital stays associated with conditions wholly or partly attributable to alcohol.

5.5.2 Methodology for Calculation

Our work on the study has used a standard international disease classification to identify conditions wholly or partly attributable to alcohol, combined with detailed information on acute hospital inpatient episodes and costs provided by DHSSPS

Classification of Conditions

The International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10)[11] is a coding of diseases and signs, symptoms, abnormal findings, complaints, social circumstances and external causes of injury or diseases, as classified by the World Health Organization (WHO).

For each code, it is possible to estimate an Alcohol-Attributable Fraction (AF), which measures the estimated proportion of cases that are thought to result from alcohol consumption. The estimated AFs therefore range between zero and one, with an estimated AF of zero implying that no cases are linked to alcohol consumption, and an estimated AF of one implying that all cases are linked to alcohol consumption.

We have used ICD-10 codes to identify the acute hospitalisation costs associated with conditions wholly or partly attributable to alcohol.

5.5.3 Data Sources Used

DHSSPS's Hospital Information Branch provided the review team with information for the 2007-08 year on:

- The number of acute inpatient episodes associated with conditions attributable to alcohol; and
- The costs associated with these episodes.

In this and other areas of the study, we have used the most recent data available regarding activity levels. While it is likely that activity levels will fluctuate annually, we have assumed that the most recent data available to us represents the best estimate of current activity.

In this context, an episode is defined as a completed period of care for a patient using a hospital bed within the health service, under one consultant, within one Health and Social Care Trust. If patients are transferred from one consultant to another, even within the same Trust, one episode ends and another begins. However, the transfer of a patient between hospitals, while remaining under the same consultant and within the same Trust, would not end the episode.

Conditions Wholly Attributable to Alcohol

Information has been provided from DHSSPS on alcohol-related activity in an acute hospital setting. Hospital Information Branch has identified inpatient episodes and day-case attendances relating to this activity for 2007-08 from the Hospital Inpatient System, using ICD-10 codes.

Relevant ICD codes were searched for in any of the seven separate diagnostic fields in the Hospital Inpatient System. As the codes were searched for in all diagnostic positions, it is possible that a patient may have one diagnosis from the list of codes defined as wholly attributable to alcohol, as well as another diagnosis defined as partly attributable to alcohol. As a result, some element of double counting is possible.

To this information, Finance Directorate within DHSSPS has applied 2007-08 Healthcare Resource Group (HRG)[53] unit costs derived from annual Trust costing returns to produce an estimate of the total average cost for an alcohol related episode. 2007-08 is the most recent year for which approved cost information is available.

The table below sets out the ICD-10 codes which are used in Northern Ireland to record admissions that are wholly attributable to alcohol (deaths and discharges are used as an approximation of admissions), together with the number of inpatient bed days in each category for 2007-08:

Table 5.4: Total Number of Inpatient Episodes Wholly Attributable to Alcohol, 2007-08

Description	Male	Female	Total
Mental and behavioural disorders due to use of alcohol	7,019	2,339	9,358
Degeneration of nervous system due to use of alcohol	41	14	55
Alcoholic polyneuropathy	16	<5	21
Alcoholic myopathy	<5	7	12
Alcoholic cardiomyopathy	51	-	51
Alcoholic gastritis	185	67	252
Alcoholic liver disease	1,285	600	1,885
Chronic pancreatitis (alcohol-induced)	200	47	247
Ethanol poisoning	536	504	1,040
Toxic effect of alcohol (unspecified)	189	192	381
Accidental poisoning by and exposure to alcohol	27	15	42
Total episodes	**8,565**	**3,334**	**11,899**

Source: DHSSPS Hospital Inpatient System

[53] A Healthcare Resource Group (HRG) is a group of clinically similar treatments and care that require similar levels of healthcare resource.

It is important to note that, as patients may be diagnosed with more than one condition during any particular episode, the total number of episodes reported above will not be the same as the number of diagnoses reported for conditions related to alcohol.

Conditions Partly Attributable to Alcohol

As well as the above, acute hospital stays will also arise from conditions which are only partly attributable to alcohol. Table 5.5 below sets out acute hospital inpatient episodes for the conditions in question, the proportions of these which are attributable to alcohol for men and women, and the weighted number of acute inpatient episodes classed as partly attributable to alcohol.

A number of conditions have been excluded from our analysis for a variety of reasons identified in a recent report by the North West Public Health Observatory[54]:

- Diabetes, ischaemic heart disease and cholelithiasis have been identified as having a negative correlation with alcohol consumption;
- No evidence has been found of a relationship between alcohol consumption and conditions including respiratory tuberculosis, stomach cancer, peptic ulcers, pneumonia and influenza; and
- In the Observatory's latest analysis, low birth weight has been allocated an alcohol-attributable fraction of zero.

Table 5.5: Acute Inpatient Episodes Partly Attributable to Alcohol, 2007-08

	MALES			FEMALES		
Description	**Episodes**	**AF**	**Weighted**	**Episodes**	**AF**	**Weighted**
Malignant neoplasms						
Lip, oral cavity and pharynx	448	0.470	211	202	0.280	57
Oesophagus	802	0.260	209	478	0.130	62
Colon	945	0.040	38	846	0.020	17
Rectum	469	0.070	33	267	0.030	8
Liver and intrahepatic bile ducts	248	0.130	32	129	0.070	9
Larynx	185	0.290	54	46	0.160	7
Breast	6	-	0	2,216	0.070	155
Epilepsy	2,918	0.540	1,576	2,761	0.530	1,463
Hypertensive diseases	18,524	0.280	5,187	20,525	0.130	2,668

[54] Jones, L., M.A. Bellis, D. Dedman, H. Sumnall and K. Tocque, (2008), 'Alcohol-Attributable Fractions for England: Alcohol-Attributable Mortality and Hospital Admissions'

	MALES			FEMALES		
Description	**Episodes**	**AF**	**Weighted**	**Episodes**	**AF**	**Weighted**
Cardiac arrhythmias	8,968	0.130	1,166	8,817	0.250	2,204
Heart failure	5,875	0.004	24	6,196	0.002	12
Haemorrhagic stroke	721	0.240	173	807	0.100	81
Ischaemic stroke	2,639	0.040	106	3,098	-0.06	0
Oesophageal varices	290	0.730	212	166	0.510	85
Gastro-oesophageal laceration-haemorrhage syndrome	74	0.470	35	72	0.470	34
Unspecified liver cirrhosis	205	0.730	150	339	0.500	170
Acute and chronic pancreatitis	1,062	0.240	255	844	0.130	110
Psoriasis	505	0.340	172	472	0.300	142
Spontaneous abortion	0	-	0	1,234	0.220	271
Road traffic accidents (driver/rider)	1,085	0.220	239	411	0.090	37
Pedestrian traffic accidents	190	0.370	70	86	0.110	9
Water transport accidents	24	0.200	5	5	0.200	1
Air and space transport accidents	6	0.160	1	5	0.160	1
Falls	5,581	0.160	893	6,821	0.160	1,091
Work/machine injuries	637	0.070	45	131	0.070	9
Firearm injuries	12	0.250	3	5	0.250	1
Drowning	8	0.340	3	5	0.340	2
Inhalation of gastric contents/ Inhalation and ingestion of food causing obstruction of the respiratory tract	76	0.250	19	60	0.250	15
Fire injuries	91	0.380	35	41	0.380	16
Accidental excessive cold	15	0.250	4	5	0.250	1
Intentional self-harm	2,738	0.340	931	3,220	0.340	1,095
Assault	1,464	0.270	395	191	0.270	52
TOTAL WEIGHTED EPISODES			**12,270**			**9.885**

Source: DHSSPS Hospital Information System, North West Public Health Observatory and FGS McClure Watters

Based on the weighted calculations in the table above, the health service in Northern Ireland delivers 12,270 episodes for men and 9,885 for women in respect of conditions partly attributable to alcohol, a total of 22,155.

5.5.4 Estimate of Alcohol-Related Cost

DHSSPS also provided information on the costs associated with acute inpatient episodes for conditions wholly or partly attributable to alcohol in 2007-08, allowing us to generate a total estimated cost at 2007-08 prices.

Relevant ICD-10 codes were searched for in any of the seven separate diagnostic fields in the Hospital Inpatient System. As the codes were searched for in all diagnostic positions, it is possible that a patient may have one diagnosis from the list of codes defined as wholly attributable to alcohol, as well as another diagnosis defined as partly attributable to alcohol. As a result, some element of double counting is possible.

To this information, Finance Directorate has applied 2007-08 Healthcare Resource Group (HRG)[55] unit costs derived from annual Trust costing returns to produce an estimate of the total average cost for an alcohol-related episode. 2007-08 is the most recent year for which approved cost information is available.

For consistency with other areas of the study, we have uplifted the total cost estimates by 2.52% to reflect 2008-09 prices. Within healthcare, inflation tends to run at a slightly higher level than in the wider economy, and the above unit cost estimate may be an underestimate of the true cost. However, the impact of this is not likely to be material since the price uplift applied is for only one year.

Combining this with our analysis above, the table below provides our base case estimate of the cost of acute inpatient episodes wholly or partly related to alcohol, based on data for 2007-08:

Table 5.6: Acute Hospitalisation Episodes

	Episodes 2007-08	Cost per Episode 2007-08 £	Total Cost at 2007-08 Prices £m	Total Cost at 2008-09 Prices £m
Conditions wholly attributable to alcohol	11,899	1,384	16.5	16.9
Conditions partly attributable to alcohol	22,155	2,141	47.4	48.6
BASE CASE ESTIMATE – ACUTE HOSPITALISATION DAYS	**34.054**		63.9	**65.5**

Source: DHSSPS Finance Directorate and FGS McClure Watters

At 2008-09 prices, we estimate a cost of **£65.5m** per annum accrues in the health service in respect of acute bed days wholly and partly attributable to alcohol.

[55] A Healthcare Resource Group (HRG) is a group of clinically similar treatments and care that require similar levels of healthcare resource.

5.5.5 Stratification and Sensitivity Analysis

We have stratified the above estimate as **firm** since it is based on specific data provided by DHSSPS. Applying a small margin of error of +/-10% around the base case estimate produces a range from a lower value of **£60.0m** to a higher value of **£72.1m.**

5.6 Hospitalisation Days – Mental Illness

5.6.1 Description

Due to negative mental illness impacts, alcohol misuse can cause additional costs to society in relation to the number of days patients spend in hospitals.

In Northern Ireland, mental illness falls under Programme of Care (POC) 5, and encompasses a number of key specialties relevant to this study, including mental illness (Specialty 710) and forensic psychiatry (Specialty 712).

5.6.2 Methodology for Calculation

To arrive at our cost estimate in this area, we sought to identify the number of hospital bed days for mental illness conditions wholly or partly related to alcohol (as derived from alcohol-related ICD codes), and to combine this with an appropriate measure of cost per bed day to yield an overall cost estimate.

5.6.3 Data Sources Used

DHSSPS does not currently record the number of bed days for mental illness conditions wholly or partly attributable to alcohol.

The only diagnosis-level information that is currently accessible relates to individuals that have been admitted to a limited number of mental illness hospitals that are using the Patient Administration System. However, the Department generally does not provide further analysis on these data in view of the limited number of sources from which they are drawn.

We understand that work is currently ongoing, led by the Health and Social Care Board, in developing a Mental Health Inpatients database. This is nearing completion and will include information from all mental illness hospitals. However, DHSSPS has indicated that data quality issues may prevent release of this information for some time yet.

In the absence of specific information on mental illness bed days attributable to alcohol, we have instead made use of information supplied by DHSSPS on the total number of bed days and cost per bed day in key specialities within POC 5 (Mental Health), and made assumptions on the proportion of these bed days which relates to alcohol misuse.

The most recent report prepared by the Scottish Government included specific numbers of psychiatric bed days and cost per bed day attributable to alcohol misuse. However, we have been unable to follow the same approach in Northern Ireland due to limitations in the detail of data available.

A previous 2008 study undertaken in Scotland indicated that around 15% of psychiatric admissions are related to alcohol misuse. The 2008 Scottish review also assumed that an additional 1% of psychiatric hospital bed days are for reasons partly linked to alcohol misuse.

For Northern Ireland, we have therefore assumed that 16% of mental illness bed days are related to alcohol overall, combining the proportions reported in Scotland.

5.6.4 Estimate of Alcohol-Related Cost

The table below sets out our base case estimate of the cost of hospitalisation days for mental illness conditions associated with alcohol misuse.

Activity data are drawn from the DHSSPS Strategic Resources Framework, using planned activity as a proxy for actual activity in 2008-09.

Cost data have been uplifted by 2.52% to reflect 2008-09 prices.

Table 5.7: Mental Illness Hospitalisation Days

	Total Bed Days	Estimated % Related to Alcohol Misuse	Estimated Bed Days Related to Alcohol Misuse	Cost per Day at 2007-08 Prices	Total Cost at 2007-08 Prices	Total Cost at 2008-09 Prices
				£	£m	£m
Mental illness	214,108	16	34,257	249	8.5	8.7
Forensic psychiatry	12,344	16	1,975	320	0.8	0.8
Total	**226,452**	**16**	**36,232**	**-**	9.3	9.5

Source: DHSSPS Strategic Resources Framework and FGS McClure Watters

Drawing directly on evidence from Scotland, the annual cost of hospitalisation days for mental health conditions associated wholly and partly with alcohol misuse in Northern Ireland would be in the region of £9.5m at 2008-09 prices.

Applying a notional 10% reduction to reflect the degree of harm caused by alcohol misuse in Northern Ireland produces a base case estimate of **£8.6m** at 2008-09 prices.

5.6.5 Stratification and Sensitivity Analysis

Our estimate for these costs has been informed by a number of assumptions and has therefore been stratified as **outline.** Applying a general sensitivity of +/-25% to the base case estimate of £8.6m produces potential values ranging from a low of **£6.5m** to a high of **£10.8m**.

5.7 Accident and Emergency Attendances

5.7.1 Description

Hospitals will also incur additional costs arising from people attending their Accident and Emergency (A&E) facilities due to alcohol-related conditions and incidents.

5.7.2 Data Sources Used

In common with its counterparts in England and Scotland, DHSSPS does not currently collect information on the number of A&E attendances wholly or partly attributable to alcohol. However, the Department has provided information on the overall number of A&E attendances (for 2008-09), as well as the average cost per attendance.

5.7.3 Methodology for Calculation

Previous studies in England and Scotland have sought to quantify the proportion of A&E visits which are linked to alcohol misuse. However, these estimates have shown a wide degree of variation, ranging from 2% to 46%.

Most recently, the Scottish Government has estimated that 25% of all A&E attendances are related to alcohol.

Studies undertaken at Altnagelvin Hospital (most recently in 2009) further indicated that:

- Around one third of all attendances at A&E had a direct link to alcohol, while many more were partly connected to alcohol misuse (e.g. people attending A&E after road accidents may be innocent sober victims of drunk drivers);
- Around 40% of all people requiring admission are ill as a consequence of alcohol misuse, for conditions including seizures, *delirium tremens,* bleeding from the gut, head injuries, acute pancreatitis and falls; and
- The later in the day people come to A&E, the more likely alcohol is to have been a relevant factor. After 11pm on weekdays, 60% of attendances at A&E were wholly related to alcohol, and after 11pm on Friday and Saturday nights, 90% of A&E attendances were alcohol-related.

The results of the Altnagelvin study are broadly in line with those from elsewhere, which provides some evidence that the assumptions adopted in our analysis are suitable in a Northern Ireland context. However, we have not felt it appropriate to assume that the particular results of the Altnagelvin research are wholly applicable to Northern Ireland as a region, since it covers only one hospital.

As detailed above, it should be noted that previous studies have suggested a significant degree of variability in this area. We have therefore performed sensitivity analysis around the base cost estimate.

5.7.4 Estimate of Alcohol-Related Cost

Table 5.8 below sets out our estimate of the cost of A&E attendances related to alcohol in Northern Ireland, including evidence from Scotland on the proportion of A&E attendances related to alcohol misuse.

Total costs have been uplifted by 2.52% from 2007-08 to 2008-09 prices.

Table 5.8: A&E Attendances

Total A&E attendances in Northern Ireland, 2008-09	732,022
Estimated proportion relating to alcohol	25%
Estimated A&E attendances relating to alcohol	**183,006**
Cost per A&E attendance (2007-08 prices)	£98
Total cost (2007-08 prices)	**£17.9m**
Total cost uplifted to 2008-09 prices (before adjustment)	**£18.4m**

Source: DHSSPS Hospital Statistics 2008-09, Trust Financial Returns and FGS McClure Watters

Based on cost and activity data provided by DHSSPS and assumptions made in the most recent studies in Scotland and England, and applying a notional 10% reduction for Northern Ireland, we estimate that the cost of A&E attendances relating to alcohol misuse is in the region of **£16.6m** per annum at 2008-09 prices.

5.7.5 Stratification and Sensitivity Analysis

Our estimate of A&E attendance costs relating to alcohol has been categorised as **outline** since it incorporates assumptions on the proportion of total A&E attendances attributable to alcohol. As noted above, we have assumed that some 25% of attendances relate to alcohol misuse, but previous studies in England and Scotland have suggested that this proportion can range anywhere from 2% to 46%.

If we assume that only 2% of attendances are related to alcohol, this produces an annual cost estimate of **£1.3m.** On the other hand, if 46% of such attendances can be attributed to alcohol, this would suggest a cost per year of some **£30.5m.**

5.8 Outpatient Hospital Visits

5.8.1 Description

Our analysis above indicates that hospitals in Northern Ireland incur significant costs in relation to alcohol-related inpatient stays. It is also very likely that a number of these inpatient admissions would lead on to subsequent outpatient visits, for patients with mental illness and other conditions.

5.8.2 Methodology for Calculation

DHSSPS has indicated that specific data are not currently available regarding the number of outpatient hospital visits which are wholly related to alcohol misuse.

For our analysis, we have therefore worked with high-level DHSSPS data on the overall number of outpatient visits (consultant-led attendances), and made appropriate assumptions on the proportion of these which may be associated with alcohol misuse.

5.8.3 Data Sources Used

DHSSPS's published Hospital Statistics for 2008-09 provide information on outpatient activity for that year, for both initial and review attendances. DHSSPS also provided us with information on the average cost per outpatient attendance for 2007-08.

5.8.4 Estimate of Alcohol-Related Cost

Table 5.9 below sets out our base case estimate of the cost of hospital outpatient attendances related to alcohol in Northern Ireland.

The Scottish Government's most recent study of the cost of alcohol misuse suggested that 2.4% of total outpatient attendances in Scotland were alcohol-related, based on primary diagnosis, for both psychiatric and non-psychiatric admissions. We have taken this estimate into account for the purposes of our review.

Cost data for 2007-08 have been uplifted by the GDP deflator (2.52%) to reflect 2008-09 price levels:

Table 5.9: Outpatient Attendances

Total consultant-led outpatient attendances, 2008-09	1,565,497
Estimated proportion relating to alcohol	2.4%
Estimated outpatient attendances relating to alcohol	**37,572**
Cost per outpatient attendance (2007-08 prices)	£150
Total cost (2007-08 prices)	£5.6m
Total cost uplifted to 2008-09 prices (before adjustment)	**£5.8m**

Source: DHSSPS Hospital Statistics and FGS McClure Watters

Based on data provided by DHSSPS and taking account of assumptions made in other recent UK studies, and applying a notional 10% reduction to reflect the relative degree of harm caused by alcohol misuse in Northern Ireland, we have estimated that the annual cost of outpatient attendances relating to alcohol misuse (at 2008-09 prices) is around **£5.2m**.

5.8.5 Stratification and Sensitivity Analysis

Since we have made assumptions on the proportion of outpatient attendances which is related to alcohol, our base case estimate has been stratified as **outline.** While we have assumed that 2.4% of attendances are related to alcohol, the Scottish Government's 2010 study notes that the proportions attributable to alcohol in this area can range from 2.2% to 2.5%.

If 2.2% of attendances related to alcohol, this would produce an annual cost of some **£4.8m,** and **£5.4m** if 2.5% of outpatient attendances are linked to alcohol misuse.

5.9 Day Hospital Visits – Mental Illness

5.9.1 Description

As with outpatient attendances, it is likely that a number of alcohol-related inpatient admissions could lead on to subsequent day hospital visits (for mental illness and other conditions).

5.9.2 Methodology for Calculation

DHSSPS informed us that no specific data were available on the number of day cases in relation to conditions which are wholly related to alcohol misuse.

For our analysis, we have again used higher-level DHSSPS data on the overall number of mental illness day case visits, and developed suitable assumptions on the proportion of these visits which may be associated with alcohol misuse.

5.9.3 Data Sources Used

Day case activity data for the Mental Illness specialty are drawn from DHSSPS Hospital Statistics for 2008-09. DHSSPS also provided information on the average cost of these day case attendances for 2007-08.

Since 2007-08, the care structure for mental health patients has changed significantly, from a consultant-led service to a multi-disciplinary team service. This new treatment method has resulted in over half of mental illness patients being reclassified as multi-disciplinary team patients as opposed to consultant-led patients.

As detailed above, the Scottish Government's 2010 study of the cost of alcohol misuse suggested that 2.4% of total outpatient and day case attendances in Scotland were alcohol-related.

5.9.4 Estimate of Alcohol-Related Cost

Table 5.10 below sets out an analysis of the cost of day case attendances for conditions linked to alcohol misuse in Northern Ireland.

Unit cost figures for 2007-08 have been uplifted by 2.52% to 2008-09 price levels:

Table 5.10: Mental Illness Day Case Attendances

	Mental Illness Specialty
Total PoC 5 day case attendances, 2008-09	1,494
Estimated proportion relating to alcohol	2.4%
Estimated mental illness day case attendances relating to alcohol	**36**
Cost per mental illness day case attendance (2007-08 prices)	£189
Total cost estimate (2007-08 prices)	£6,804
Total cost estimate uplifted to 2008-09 prices (before adjustment)	**£6,975**

Source: DHSSPS Hospital Statistics and FGS McClure Watters

Based on our analysis above, and applying a 10% reduction for Northern Ireland, we estimate that minimal annual costs in the order of **£6,278** arise from psychiatric day hospital visits associated with alcohol misuse, at 2008-09 prices.

5.9.5 Stratification and Sensitivity Analysis

Our base case estimate in this area has been stratified as **outline,** since we have made assumptions on the proportion of attendances which is related to alcohol. While we have assumed that 2.4% of attendances are related to alcohol, the Scottish Government's 2010 study suggests that the proportions attributable to alcohol in this area can range from 2.2% to 2.5%.

If 2.2% of the above attendances are assumed to relate to alcohol, this would produce an annual cost of some **£5,755,** compared to **£6,540** if 2.5% of psychiatric outpatient attendances are linked to alcohol.

5.10 Day Hospital Visits – Non-Mental Illness

5.10.1 Description

This cost element refers to day case visits for conditions other than mental illness which are associated with alcohol. These are again likely to arise from previous inpatient admissions for reasons connected with alcohol.

5.10.2 Methodology for Calculation

We have estimated costs in this area by examining the number of day case visits identified as wholly or partly related to alcohol, together with the average cost calculated for each of these attendances.

5.10.3 Data Sources Used

DHSSPS was able to provide specific data on both the number of non-mental illness day case visits attributable to alcohol in Northern Ireland (derived from alcohol-related ICD-10 codes) and the average unit cost per attendance for these visits for 2007-08.

As with acute inpatient days, relevant ICD-10 codes were searched for in any of the seven separate diagnostic fields in the Hospital Inpatient System. As the codes were searched for in all diagnostic positions, it is possible that a patient may have one diagnosis from the list of codes defined as wholly attributable to alcohol, as well as another diagnosis defined as partly attributable to alcohol. As a result, some element of double counting is possible.

To this information, Finance Directorate has applied 2007-08 Healthcare Resource Group (HRG)[56] unit costs derived from annual Trust costing returns to produce an estimate of the total average cost for an alcohol-related attendance. 2007-08 is the most recent year for which approved cost information is available.

Day Hospital Visits Wholly Attributable to Alcohol

As for acute hospital inpatient episodes, DHSSPS provided information on the number of day case attendances in 2007-08 for ICD-10 codes wholly attributable to alcohol:

Table 5.11: Total Day Case Attendances Wholly Attributable to Alcohol, 2007-08

Description	Male	Female	Total
Mental and behavioural disorders due to use of alcohol	102	10	112
Alcoholic polyneuropathy	5	-	5
Alcoholic myopathy	-	<5	<5
Alcoholic gastritis	<5	-	<5
Alcoholic liver disease	57	28	85
Chronic pancreatitis (alcohol-induced)	<5	-	<5
Total attendances	**166**	**38**	**204**

Source: DHSSPS Hospital Inpatient System

It is important to note that, as patients may be diagnosed with more than one condition in relation to any particular attendance, the total number of attendances reported above will not be the same as the number of diagnoses reported for conditions related to alcohol.

Day Hospital Visits Partly Attributable to Alcohol

Table 5.12 below sets out day case attendances for the conditions in question, the proportions of these which are attributable to alcohol for men and women, and the weighted number of attendances classed as partly attributable to alcohol.

[56] A Healthcare Resource Group (HRG) is a group of clinically similar treatments and care that require similar levels of healthcare resource.

A number of conditions have been excluded from our analysis for a variety of reasons identified in a recent report by the North West Public Health Observatory[57]:

- Diabetes, ischaemic heart disease and cholelithiasis have been identified as having a negative correlation with alcohol consumption;
- No evidence has been found of a strong relationship between alcohol consumption and conditions including respiratory tuberculosis, stomach cancer, peptic ulcers, pneumonia and influenza; and
- In the Observatory's latest analysis, low birth weight has been allocated an alcohol-attributable fraction of zero.

Table 5.12: Day Case Attendances Partly Attributable to Alcohol, 2007-08

	MALES			FEMALES		
Description	**Episodes**	**AF**	**Weighted**	**Episodes**	**AF**	**Weighted**
Malignant neoplasms						
Lip, oral cavity and pharynx	23	0.470	11	22	0.280	6
Oesophagus	299	0.260	78	126	0.130	16
Colon	2,194	0.040	88	1,539	0.020	31
Rectum	1,161	0.070	81	577	0.030	17
Liver and intrahepatic bile ducts	59	0.130	8	32	0.070	2
Larynx	11	0.290	3	5	0.160	1
Breast	5	-	0	5,370	0.070	376
Epilepsy	196	0.540	106	182	0.530	96
Hypertensive diseases	2,282	0.280	639	2,470	0.130	321
Cardiac arrhythmias	1,075	0.130	140	481	0.250	120
Heart failure	145	0.004	1	61	0.002	0
Haemorrhagic stroke	204	0.240	49	179	0.100	18
Ischaemic stroke	496	0.040	20	258	-0.06	-15
Oesophageal varices	170	0.730	124	122	0.510	62
Gastro-oesophageal laceration-haemorrhage syndrome	6	0.470	3	5	0.470	2
Unspecified liver cirrhosis	29	0.730	21	54	0.500	27
Acute and chronic pancreatitis	27	0.240	6	28	0.130	4

[57] Jones, L., M.A. Bellis, D. Dedman, H. Sumnall and K. Tocque, (2008), 'Alcohol-Attributable Fractions for England: Alcohol-Attributable Mortality and Hospital Admissions'

	MALES			FEMALES		
Description	Episodes	AF	Weighted	Episodes	AF	Weighted
Psoriasis	1,313	0.340	446	1,235	0.300	371
Spontaneous Abortion	0	-	0	43	0.220	9
Road traffic accidents (driver/rider)	8	0.220	2	5	0.090	0
Pedestrian traffic accidents	0	0.370	0	5	0.110	1
Water transport accidents	0	0.200	0	0	0.200	0
Air and space transport accidents	0	0.160	0	0	0.160	0
Falls	104	0.160	17	40	0.160	6
Work/machine injuries	5	0.070	0	5	0.070	0
Firearm injuries	0	0.250	0	0	0.250	0
Drowning	0	0.340	0	0	0.340	0
Inhalation of gastric contents/ Inhalation and ingestion of food causing obstruction of the respiratory tract	0	0.250	0	5	0.250	1
Fire injuries	5	0.380	2	0	0.380	0
Accidental excessive cold	0	0.250	0	0	0.250	0
Intentional self-harm	5	0.340	2	5	0.340	2
Assault	102	0.270	28	16	0.270	4
TOTAL WEIGHTED ATTENDANCES			**1,873**			**1,480**

Source: DHSSPS Hospital Inpatient System, North West Public Health Observatory and FGS McClure Watters

It is important to note that, as patients may be diagnosed with more than one condition in relation to any particular attendance, the total number of attendances reported above will not be the same as the number of diagnoses reported for conditions related to alcohol.

Based on the weighted calculation above, some 1,873 day case attendances for men and 1,480 for women were incurred in 2007-08 for conditions partly related to alcohol misuse, a total of 3,353.

5.10.4 Estimate of Alcohol-Related Cost

For conditions wholly related to alcohol misuse, information provided by DHSSPS indicates the 2007-08 cost per attendance was £548. Combining this with the 204 estimated attendances in Table 5.12 above yields an annual cost estimate of £112,000. Uplifting this by 2.52% to reflect 2008-09 prices produces a cost estimate of £115,000.

For conditions partly related to alcohol misuse, information supplied by DHSSPS suggests the cost per attendance was £529 in 2007-08. For the 3,353 day case attendances estimated as

partly attributable to alcohol in Table 5.13, this would produce a cost estimate of £1.77m at 2007-08 prices. Uplifting by 2.52% to reflect 2008-09 prices would yield a cost estimate of £1.8m.

From the sum of the above estimates for conditions wholly and partly linked to alcohol misuse, we estimate that the annual cost relating to alcohol misuse in Northern Ireland in this area is in the region of **£1.9m.**

Since our estimate in this area is based on specific data for Northern Ireland rather than assumptions based on evidence from Scotland, we have not applied any notional reduction to reflect differences in the degree of harm caused by alcohol misuse..

5.10.5 Stratification and Sensitivity Analysis

This cost estimate has been stratified as **firm** as it is based on specific information provided by DHSSPS. Applying a margin of error of +/-10% around the base case produces a lower cost estimate of **£1.7m** and a higher cost estimate of **£2.1m.**

5.11 Community Psychiatric Teams

5.11.1 Description

This area of our analysis covers a wide variety of activities within health and social care, including community psychiatric nursing, clinical psychology and community addiction teams.

5.11.2 Methodology for Calculation

We understand from DHSSPS that no specific data are currently available on the expenditure and activity levels related to alcohol misuse within these service areas.

As in other parts of our analysis, we have worked with more generic DHSSPS data on the overall number of patient contacts in these areas, and developed suitable assumptions on the proportion of these contacts which may be linked to alcohol misuse.

5.11.3 Data Sources Used

Through its Trust Database, DHSSPS was able to provide data for 2007-08 on the number of contacts undertaken within community psychiatric nursing, clinical psychology and community addiction teams, as well as the reference cost per contact for each of these areas. We have assumed that the number of such contacts will not vary materially year on year.

In its 2010 study of the costs of alcohol misuse, the Scottish Government has assumed that 2.4% of contacts within community psychiatric nursing and clinical psychology are alcohol-related. Similar to other areas we have examined, we have assumed the same proportion would be appropriate in Northern Ireland, based on a comparison of reported levels and patterns of alcohol consumption in Scotland and Northern Ireland.

Previous studies in Scotland have assumed that 50% of the cost of community addiction teams is related to alcohol (rather than drugs). In our analysis for Northern Ireland, we have

assumed that 80% of these costs are alcohol-related, in line with the Department's 2007 Census of Drug and Alcohol Treatment Services in Northern Ireland.

5.11.4 Estimate of Alcohol-Related Cost

Table 5.13 below presents our base case estimate of the cost relating to alcohol misuse within community psychiatric teams in Northern Ireland. Total costs have been uplifted from 2007-08 to 2008-09 price levels by applying a GDP deflator of 2.52%.

Table 5.13: Community Psychiatric Teams

	Community Psychiatric Nursing	Clinical Psychology	Community Addiction Teams	TOTAL
Total contacts, 2007-08	181,641	40,266	36,349	258,256
Estimated proportion relating to alcohol	2.4%	2.4%	80%	-
Estimated contacts relating to alcohol	**4,359**	**966**	**29,079**	**34,404**
Cost per contact (2007-08 prices)	£95	£198	£136	
Total cost at 2007-08 prices	£0.4m	£0.2m	£4.0m	£4.6m
Total cost at 2008-09 prices (before adjustment)	**£0.4m**	**£0.2m**	**£4.1m**	**£4.7m**

Source: DHSSPS Finance Directorate and FGS McClure Watters

Based on our analysis in this area, at 2008-09 prices, we estimate that annual costs of some £4.7m are associated with community psychiatric teams dealing with alcohol misuse, in the light of evidence from Scotland and before any adjustment to reflect the degree of harm caused by alcohol misuse in Northern Ireland.

Applying a notional 10% reduction for the Northern Ireland context produces a base case cost estimate of some **£4.2m.**

5.11.5 Stratification and Sensitivity Analysis

We have had to employ assumptions in estimating the proportion of the above activity which relates to alcohol and have therefore stratified this estimate as **outline.** Applying a general sensitivity of +/-25% around the base case cost estimate of £4.2m yields a range of potential values from **£3.2m** to **£5.3m.**

5.12 Health Promotion

5.12.1 Description

In this section of the report, we examine costs arising within the former Health Promotion Agency (now part of the HSC Public Health Agency) in relation to advertising and educational activities designed to reduce alcohol misuse.

5.12.2 Methodology for Calculation

We requested specific information from the Public Health Agency regarding the former HPA's annual expenditure aimed at reducing the level of social harm caused by alcohol misuse.

5.12.3 Data Sources Used

In our analysis, we have used specific information regarding the HPA's expenditure on information and education campaigns related to alcohol misuse, including public and professional information and seminars.

5.12.4 Estimate of Alcohol-Related Cost

In 2008-09, the HPA incurred expenditure of **£350,783** in respect of alcohol education within health promotion.

5.12.5 Stratification and Sensitivity Analysis

As we have used specific information from the HPA in developing our estimate of health promotion expenditure associated with alcohol, we have classified the resultant cost as **firm** and adopted a general sensitivity of +/-10% around the base case. This produces a lower cost estimate of **£0.3m** and a higher estimate of **£0.4m**.

5.13 Drug and Alcohol Coordination Teams

5.13.1 Description

Under the New Strategic Direction for Alcohol and Drugs, the Department provides funding to four regional Drugs and Alcohol Coordination Teams (DACTs), covering the Northern, Southern, Eastern and Western regions of Northern Ireland.

An element of the funding provided to DACTs will relate to their role in tackling alcohol misuse.

5.13.2 Methodology for Calculation

For our work in this area, we approached the four DACTs seeking specific information on the funding they receive under the New Strategic Direction.

We then made an assumption on the proportion of DACT funding relating to alcohol misuse as opposed to drug misuse.

5.13.3 Data Sources Used

Three of the DACTs (Northern, Southern and Eastern) were able to provide the information we requested directly.

The Western DACT was not in a position to provide the full detail requested (due to staff resourcing issues) but we were able to source information on funding from DHSSPS as an alternative estimate.

5.13.4 Estimate of Alcohol-Related Cost

Table 5.14 below sets out the funding received by DACTs under the New Strategic Direction for 2008-09:

Table 5.14: NSD Funding to DACTs

	Total £'000
Northern	1,226
Southern	1,014
Eastern	2,230
Western	863
TOTAL	**5,333**

Source: DACTs, DHSSPS and FGS McClure Watters

There is no specific evidence available on the proportion of the above expenditure which relates to alcohol misuse (as opposed to drugs misuse). However, drawing on discussions with the DACTs, we have made an informed assumption that some 65% of the above costs are linked to alcohol.

Based on this assumption, we estimate that NSD funding provided to the four DACTs in relation to alcohol misuse amounts to **£3.5m** per annum (65% of total funding).

Since our estimate in this area is based on specific data for Northern Ireland rather than assumptions based on evidence from Scotland, we have not applied any notional reduction to reflect differences in the degree of harm caused by alcohol misuse.

5.13.5 Stratification and Sensitivity Analysis

This element is stratified as an **outline** cost estimate since we have had to make assumptions on the proportion of DACTs' activities which relate to alcohol misuse.

We have therefore applied a general sensitivity of +/-25% around our base case estimate above, yielding a range of **£2.6m** to **£4.3m**.

5.14 Ambulance Journeys

5.14.1 Description

Emergency ambulance and paramedic journeys associated with alcohol misuse will also generate additional expenditure within the health service in Northern Ireland. Within the

Northern Ireland Ambulance Service (NIAS), costs arise in relation to these and other patient care activities which may or may not result in visits to hospital.

5.14.2 Methodology for Calculation

For our work in this area, we approached NIAS seeking specific data on the number of emergency callouts related to alcohol. However, NIAS indicated that, while it captures clinical information relevant to the clinical management of patients, use of alcohol is not a clinical diagnosis and it does not hold detailed information on whether individual ambulance callouts are specifically related to incidents of alcohol misuse.

In the light of these constraints on information, we have made an estimate of the proportion of NIAS's annual operating cost which is assumed to relate to alcohol misuse, drawing on evidence from other recent studies in the UK.

5.14.3 Data Sources Used

Previous studies of the costs of alcohol misuse in the UK have sought to estimate the proportion of emergency ambulance journeys related to alcohol. However, these estimates have shown a wide degree of variation, ranging from as low as 1% to as high as 35% of total emergency journeys.

Within this range, the Scottish Government's 2010 study estimated that emergency ambulance journeys related to alcohol generated an annual cost of £24.4m. Alcohol misuse was therefore estimated to represent 14% of the Scottish Ambulance Service's overall yearly expenditure of £179.6m and 18% of journeys.

5.14.4 Estimate of Alcohol-Related Cost

NIAS's financial statements for 2008-09 show it had a net resource outturn (operating cost) of £51.6m in that year. Assuming that 14% of this expenditure relates to alcohol (as in Scotland) would produce an estimated cost to NIAS of £7.2m a year.

Applying a notional 10% reduction to reflect the degree of harm caused by alcohol misuse in Northern Ireland yields a base case estimate of **£6.5m** in annual costs, representing 18% of journeys.

5.14.5 Stratification and Sensitivity Analysis

This element is stratified as an **outline** cost estimate since we have had to make assumptions on the proportion of ambulance journeys which are associated with alcohol misuse in Northern Ireland.

To present a broader range of values, we have taken account of evidence from other studies in England and Scotland, which suggest that between 12% and 35% of road ambulance journeys are connected to alcohol misuse. Based on these estimates:

- A proportion of 12% would yield an annual cost of **£4.3m;** and
- A proportion of 35% would suggest annual expenditure of **£12.6m**.

5.15 Summary of Cost Estimates – Healthcare

Table 5.15 below summarises our estimates of the costs arising to the health service in relation to alcohol misuse, covering both our base case cost estimates and the results of the sensitivity analysis we have performed:

Table 5.15: Summary of Cost Estimates – Healthcare

Section	Cost Element	Firm or Outline	ANNUAL COST ESTIMATE		
			Base Case	Lower	Upper
			£m	£m	£m
5.2	GP-prescribed drugs	Firm	**0.3**	0.3	0.3
5.3	GP/practice nurse consultations attributable to alcohol	Outline	**9.3**	4.6	14.0
5.4	Laboratory testing in primary care	Outline	**0.1**	0.1	0.1
5.5	Hospitalisation days – acute	Firm	**65.5**	60.0	72.1
5.6	Hospitalisation days – mental illness	Outline	**8.6**	6.5	10.8
5.7	A&E attendances	Outline	**16.6**	1.3	30.5
5.8	Outpatient hospital visits	Outline	**5.2**	4.8	5.4
5.9	Day hospital visits – mental illness	Outline	**<0.1**	<0.1	<0.1
5.10	Day hospital visits – non-mental illness	Firm	**1.9**	1.7	2.1
5.11	Community psychiatric teams	Outline	**4.2**	3.2	5.3
5.12	Health promotion	Firm	**0.4**	0.3	0.4
5.13	Drug and Alcohol Coordination Teams	Outline	**3.5**	2.6	4.3
5.14	Ambulance journeys	Outline	**6.5**	4.3	12.6
	TOTAL ESTIMATED COST TO HEALTHCARE		**122.2**	**89.8**	**158.0**

Our analysis of the annual costs above produces a base case estimate of **£122.2m** for costs arising in relation to healthcare, the majority of which comprises hospitalisation days (acute and psychiatric), non-psychiatric outpatient attendances and attendances at A&E.

We have also conducted sensitivity analysis to reflect the impact of changes to assumptions we have made, and this produces a range of cost values from **£89.8m** to **£158.0m**. In particular, a high degree of variability around the base case is noted for:

- GP/practice nurse consultations attributable to alcohol;
- A&E attendances;
- Outpatient visits to non-psychiatric hospitals; and
- Ambulance journeys.

For comparison purposes only, applying evidence from Scotland directly without adjustment for the Northern Ireland context produces the following base case estimates:

Table 5.16: Summary of Cost Estimates – Healthcare (With and Without Adjustment)

Cost Element	With Adjustment £m	Without Adjustment £m
GP-prescribed drugs	**0.3**	0.3
GP/practice nurse consultations attributable to alcohol	**9.3**	10.4
Laboratory testing in primary care	**0.1**	0.1
Hospitalisation days – acute	**65.5**	65.5
Hospitalisation days – mental illness	**8.6**	9.5
A&E attendances	**16.6**	18.4
Outpatient hospital visits	**5.2**	5.8
Day hospital visits – mental illness	**<0.1**	<0.1
Day hospital visits – non-mental illness	**1.9**	1.9
Community psychiatric teams	**4.2**	4.7
Health promotion	**0.4**	0.4
Drug and Alcohol Coordination Teams	**3.5**	3.5
Ambulance journeys	**6.5**	7.2
TOTAL ESTIMATED COST TO HEALTHCARE	**122.2**	**127.8**

The cost estimates developed are not significantly different if no adjustment is made to reflect the relative degree of harm caused by alcohol misuse in Northern Ireland.

6 COST ANALYSIS – SOCIAL WORK

6.1 Introduction

In this part of the study, we address the additional costs arising from alcohol misuse within social work, community care and children's services.

The areas we have covered within this theme are set out in Table 6.1 below, which also provides cross-references to our detailed work on each cost element later in the section:

Table 6.1: Alcohol-Related Cost Elements within Social Work

Cost Element	Section
Children and family services	6.2
Youth justice	6.3
Criminal justice social work	6.4

6.2 Children and Family Services

6.2.1 Description

A proportion of overall public spending on health and social care services for families and children will comprise expenditure for cases where alcohol misuse has been cited as a factor in referral.

6.2.2 Methodology for Calculation

For our work in this area of the review, we approached DHSSPS to request specific information on the level of social work expenditure related wholly or partly to alcohol misuse. However, we were informed that the Department does not routinely record or collate information of this nature.

In the light of these constraints on the availability of information, we have therefore identified the total level of expenditure on services to families and children in Northern Ireland, and made an assumption of the proportion of these costs which relate to alcohol misuse, in the light of similar recent studies elsewhere in the UK.

6.2.3 Data Sources Used

To develop our cost estimate in this service area, we have made use of source data from the DHSSPS Summary of Health and Social Care Expenditure for 2007-08 (published in February 2010), with specific reference to expenditure categorised under Programme of Care (POC) 3, covering Family and Childcare.

6.2.4 Estimate of Alcohol-Related Cost

In 2007-08, total expenditure on Family and Childcare services in Northern Ireland was some £166.6m. For consistency, we have uplifted this figure to 2008-09 prices by applying a GDP deflator of 2.52%, producing a restated figure of £170.8m.

The Scottish Government's 2008 study estimated that some 24% of expenditure on social work services to children and families related to cases in which alcohol was cited as a factor in referral. The Scottish Government's 2010 review of the cost of alcohol misuse estimated that between 15% and 45% of social work volume is alcohol-related and identified a proportion of 24% as a key point within this range.

Based on our analysis of alcohol consumption patterns across the UK, we have assumed that the same proportion of Family and Childcare social services expenditure in Northern Ireland is related to alcohol misuse. Based on the 2007-08 expenditure figures reported by DHSSPS for POC 3, and restating to 2008-09 prices, this would suggest an annual cost burden of some £41.0m.

Applying a notional 10% reduction for the Northern Ireland context as in earlier sections of the report produces a base case cost estimate of **£36.9m** per annum.

6.2.5 Stratification and Sensitivity Analysis

We have made a number of assumptions in developing our work in this area and have therefore stratified the resulting cost estimate as **outline**.

While we have assumed 24% of Family and Childcare expenditure is related to alcohol misuse as our base case estimate, the January 2010 report published by the Scottish Government suggests that between 15% and 45% of social work volume may be alcohol-related. Based on this range, a proportion of 15% would produce a cost estimate of **£23.1m** and a proportion of 45% would indicate annual costs of some **£69.2m**.

6.3 Youth Justice

6.3.1 Description

The Youth Justice Agency forms part of the wider criminal justice system and its aim is to reduce youth crime and build confidence in the system of youth justice in Northern Ireland.

Young people may be referred to the Agency either as a result of committing offences or being at risk of offending behaviour. Alcohol misuse (either on the part of young people or their parents) can play a role in generating referrals.

6.3.2 Methodology for Calculation

We requested specific information from the Agency regarding the proportion of its referrals and overall workload related to alcohol misuse. However, we were informed that data are currently not gathered and collated in this format.

The Agency indicated that it does not have specific systems in place to record and collate information on the level of alcohol misuse amongst its service users.

Furthermore, we were informed that young people are referred to the Agency purely as a result of offending, or being at risk of offending behaviour, rather than on the grounds of alcohol misuse. Also, in the majority of cases where alcohol has been confiscated from a young person by the police, this is not the reason for subsequent arrest. The Agency acknowledges that alcohol misuse may be a contributory factor in many offences but does not currently record detailed information in this regard.

In the light of these limitations, we have taken into account the results of a recent pilot scheme within the Agency to identify the proportion of referrals relating to alcohol misuse, as detailed below.

6.3.3 Data Sources Used

To develop our cost estimates in respect of criminal justice social work, we have also used information from the Agency's annual financial statements for the year ended 31 March 2009.

6.3.4 Estimate of Alcohol-Related Cost

For the 2008-09 financial year, the Agency's net cost of operations (excluding exceptional items) was around £20.9m.

Although the Agency does not gather or hold detailed information on the role alcohol misuse plays in referrals, its Community Services Directorate took part in a pilot scheme for the Regional Initial Assessment Tool (RIAT) between February 2008 and March 2009. RIAT is used with young people in a range of circumstances, including:

- As a result of a request for help concerning substance use/misuse;
- In response to a substance use/misuse incident;
- If the child or young person is suspected of, or known to be, using drugs; and
- When a child or young person vulnerable to substance misuse comes into contact with youth services.

During the pilot period, the Directorate had a total of 1,159 new referrals, within which 316 RIAT assessments were completed. All referrals are considered for the need for a RIAT assessment, and the assessment is conducted where a potential linkage to alcohol misuse is identified. Of the RIAT assessments completed, a total of 200 were associated with alcohol misuse:

- 152 were linked to the misuse of alcohol by young people; and
- 48 were linked to the misuse of alcohol by young people's parents.

Based on the above, during the RIAT pilot period, 200 of the 1,159 new referrals received by the Agency were related to alcohol misuse by young people or their parents. This represents 17% of the total number of referrals in the pilot period.

We have therefore assumed that **17%** of the Agency's annual operating expenditure of £20.9m is associated with alcohol misuse, equivalent to an annual cost of **£3.6m** at 2008-09 prices.

6.3.5 Stratification and Sensitivity Analysis

We have used specific information provided by the Youth Justice Agency in addressing this area and have therefore classified the resulting cost estimates as **firm.**

We have also examined the impacts of applying a general margin of error of +/-10% around the base case estimate. This would produce a low-end cost estimate of **£3.3m** and a top-end figure of **£4.0m.**

6.4 Criminal Justice Social Work

6.4.1 Description

The responsibilities of the Probation Board for Northern Ireland (PBNI) include the supervision of offenders under Probation Orders and Community Service Orders, and writing Pre-Sentence Reports to help the courts determine appropriate sentences.

A proportion of the offences committed by the individuals under supervision may be related to alcohol misuse, resulting in increased costs in terms of probation expenditure.

6.4.2 Methodology for Calculation

As part of our review, we approached the PBNI to request specific information on the number of people subject to Board supervision for reasons related to alcohol. The Board supplied us with data on the proportions of Pre-Sentence Reports and individuals under supervision for offences related to alcohol.

We have used the information provided in estimating the overall proportion of PBNI's workload which relates to alcohol misuse.

6.4.3 Data Sources Used

We have utilised information from the PBNI's 2007-08 financial statements on its expenditure in making our estimates of costs in this area.

6.4.4 Estimate of Alcohol-Related Cost

In 2007-08, the PBNI's net expenditure was some £15.5m. For consistency, we have restated this figure to 2008-09 prices by applying an inflationary uplift of 2.52%, producing a revised expenditure figure of £15.9m.

Information provided by the PBNI for the 2008-09 year indicates that:

- In 53% of Pre-Sentence Reports written, alcohol was assessed as contributing to offending behaviour; and
- Alcohol was assessed as contributing to offending behaviour in 46% of persons under supervision.

From the range indicated by the above metrics, we estimate that some 50% of the Board's workload and expenditure is associated with alcohol misuse.

Applying this percentage to the PBNI's net expenditure would suggest that the Board incurs annual costs of around **£8.0m** in relation to offenders under supervision for alcohol-related crimes.

6.4.5 Stratification and Sensitivity Analysis

This cost estimate has been stratified as **firm** as we have based our analysis on specific information supplied by the PBNI.

Applying a general 10% sensitivity around the base case produces a range of estimates from **£7.2m** to **£8.8m**.

6.5 Summary of Cost Estimates – Social Work

Table 6.2 sets out our cost estimates and sensitivity analysis in relation to social work expenditure attributable to alcohol:

Table 6.2: Summary of Cost Estimates – Social Work

Section	Cost Element	Firm or Outline	ANNUAL COST ESTIMATE		
			Base Case	Lower	Upper
			£m	£m	£m
6.2	Children and family services	Outline	**36.9**	23.1	69.2
6.3	Youth justice	Firm	**3.6**	3.3	4.0
6.4	Criminal justice social work	Firm	**8.0**	7.2	8.8
	TOTAL ESTIMATED COST TO SOCIAL WORK		**48.5**	**33.6**	**82.0**

Our base case estimate of costs arising within social work is **£48.5m** per annum, with around three quarters of this being accounted for by children and family services taken forward by HSC Trusts. After sensitivity analysis, costs in this area range from **£33.6m** to **£82.0m,** with particular fluctuations arising from the proportion of children and family services assumed to be attributable to alcohol misuse.

Again, applying evidence from Scotland directly without any adjustment for the Northern Ireland context produces the following base case cost estimates:

Table 6.3: Summary of Cost Estimates – Social Work (With and Without Adjustment)

Cost Element	With Adjustment £m	Without Adjustment £m
Children and family services	**36.9**	41.0
Youth justice	**3.6**	3.6
Criminal justice social work	**8.0**	8.0
TOTAL ESTIMATED COST TO SOCIAL WORK	**48.5**	**52.6**

The figures reported do not vary significantly if no adjustment is made for the relative degree of harm caused by alcohol misuse in Northern Ireland.

7 COST ANALYSIS – FIRE AND POLICE

7.1 Introduction

This section of the report examines the estimated additional costs of alcohol misuse to the Northern Ireland Fire and Rescue Service (NIFRS) and the Police Service of Northern Ireland (PSNI).

In developing our cost estimates, we have again drawn on evidence from previous relevant studies. We have followed the approach adopted in the Scottish Government's 2008 study (rather than the 2010 report) as the methodology adopted in 2008 is better suited to the level of data available in the Northern Ireland context.

Table 7.1 below summarises the areas we have explored within this theme and provides cross-references to our detailed work on each cost element later in the section:

Table 7.1: Alcohol-Related Cost Elements in the Emergency Services

Cost Element	Section
Fire service callouts	7.2
Policing for alcohol-related crime	7.3
Policing for violent crime partly related to alcohol	7.4
Policing for other crime partly related to alcohol	7.5

7.2 Fire Service Callouts

7.2.1 Description

Alcohol misuse can play a role in fires (whether accidental or deliberate) and road traffic collisions which the NIFRS may be required to attend.

7.2.2 Methodology for Calculation

We approached the NIFRS directly to request specific information on callouts relating to alcohol misuse. However, the Service indicated it does not record or hold data on whether alcohol is involved in individual incidents.

In developing our analysis, we have therefore worked with higher-level data from the NIFRS Annual Report on its overall operating costs and level of activity, and used evidence from other UK studies to develop appropriate assumptions on the proportions relating to alcohol.

The Scottish Government's 2008 study of the costs of alcohol misuse estimated that some 10% of 'primary fires[58]' are started deliberately. We have adopted the same assumption in estimating the proportion of primary fires started deliberately in Northern Ireland.

The Scottish study further assumed that 25% of these deliberate fires were related to alcohol. For Northern Ireland, we have again assumed this proportion would also apply, given the reported profile of alcohol usage in both jurisdictions.

In line with the 2008 Scottish review, we have not attempted to make estimates in relation to the costs the NIFRS incurs in attending other (secondary) fires or road traffic accidents related to alcohol.

7.2.3 Data Sources Used

In developing our cost estimates, we have made use of:

- The NIFRS Annual Report for 2008-09 (as a measure of the Service's overall operating cost); and
- NIFRS published statistics on calls received and mobilised (using calls mobilised as a measure of activity as in other previous studies).

7.2.4 Estimate of Alcohol-Related Cost

In 2008-09, the NIFRS was mobilised for a total of 30,409 callouts, of which 3,924 (12.9%) related to primary fires. For the reasons outlined above, we have estimated that 10% (or 392 in total) of these primary fires were started deliberately.

On the assumption that 25% of deliberate primary fires are related to alcohol misuse, this would indicate that the NIFRS received some 98 callouts in 2008-09 which were associated with alcohol. This would represent 0.3% of the total number of incidents attended by the NIFRS during the year.

The NIFRS's annual reported expenditure for 2008-09 was £110.1m. On the assumption that 0.3% of the Service's activity is related to alcohol, this would indicate that alcohol misuse imposes an annual cost of some £0.4m in relation to fire service callouts at 2008-09 prices.

Applying a notional 10% reduction to reflect relative degrees of harm caused by alcohol misuse in Northern Ireland and Scotland, this produces a base case cost estimate of **£0.4m** per annum.

7.2.5 Stratification and Sensitivity Analysis

Since we have found it necessary to make assumptions regarding the proportion of fires related to alcohol misuse, we have classed this cost estimate as **outline** and conducted sensitivity analysis to establish a range of possible values for this element of cost.

[58] Primary fires include fires resulting in casualties, rescues or those attended by five or more appliances

Applying a margin of error of +/-25% to the base case estimate developed produces a lower estimate of **£0.3m** and a higher estimate of **£0.5m.**

7.3 Policing for Alcohol-Related Crime

7.3.1 Description

Other recent studies of the cost of alcohol misuse have examined the expenditure incurred by the police in relation to offences wholly linked to alcohol, such as drink-driving and being drunk and disorderly in a public place.

7.3.2 Methodology for Calculation

In the course of our work, we liaised with the PSNI regarding information for use in the study. The PSNI informed us that offences such as street drinking and drink-driving are not included in annual recorded crime statistics, and are more typically reported on an *ad hoc* basis (e.g. drink-driving figures will often be reported after the Christmas and New Year holiday season).

To estimate the cost to society in respect of public drunkenness and drink driving, we have therefore used cost data from the Scottish Government's most recent review to supplement information available in Northern Ireland.

7.3.3 Data Sources Used

The PSNI provided us with specific information on the number of recorded incidents of drink-driving and street drinking in Northern Ireland in recent years, albeit subject to certain caveats around the accuracy of data capture. In 2008-09:

- 2,251 incidents of street drinking were recorded by police; and
- 2,737 people were tested for drink-driving and found to be over the legal blood alcohol limit.

7.3.4 Estimate of Alcohol-Related Cost

The Scottish Government's January 2010 study examined a number of policing costs which arise from offences wholly related to alcohol misuse (e.g. detention of individuals due to drunkenness or awaiting breathalyser tests). It is assumed that systems for capturing data on street drinking are comparable between Scotland and Northern Ireland.

Specific information on the unit costs associated with processing these offences was not available for Northern Ireland.

Table 7.2 below summarises the findings on cost and activity levels reported in Scotland and presents our estimates of these costs in the Northern Ireland context:

Table 7.2: Policing Offences Wholly Related to Alcohol

	Drink-Driving	Street Drinking
Estimated custody costs (2007-08 prices) – Scotland	£1,508,736	£1,006,259
Offences recorded by police – Scotland	10,697	6,702
Unit cost (2007-08 prices) – Scotland	£141.04	£150.14
Offences recorded by police – Northern Ireland	2,737	2,251
Estimated custody costs (2007-08 prices) – Northern Ireland	**£386,026**	**£337,965**

Source: Scottish Government, PSNI and FGS McClure Watters

The analysis above suggests that wholly alcohol-related crime generates around £0.72m of annual expenditure using 2007-08 prices.

Rebasing this figure to 2008-09 prices (using the GDP deflator of 2.52%) yields a cost estimate of £0.7m in this area, before any adjustment for the Northern Ireland context.

Applying a notional 10% reduction to reflect the relative degree of harm caused by alcohol misuse in Northern Ireland produces our base case estimate of **£0.7m.**

7.3.5 Stratification and Sensitivity Analysis

While the above analysis has been based on specific data from the PSNI on the number of offences recorded, we have had to make assumptions regarding the unit costs of offences. We have therefore stratified this estimate as **outline.**

If a margin of error of +/-25% is applied to the base case estimate, this produces a range of potential values from **£0.5m** to **£0.8m**.

7.4 Policing for Violent Crime Partly Related to Alcohol

7.4.1 Description

In previous research, alcohol has been identified as a major factor involved in a range of violent offences, including physical and sexual assaults.

7.4.2 Methodology for Calculation

For our work on the assignment, we requested specific information from the PSNI on the number of violent crimes recorded as having an association with alcohol misuse. However, the PSNI indicated that it would not be able to provide data of the required completeness and quality in this area.

In the absence of specific data on the number of violent offences recorded as having a link to alcohol misuse, we have used information published by the PSNI regarding overall levels of

recorded crime, and made assumptions on the proportion of recorded violent offences which are associated with alcohol misuse.

The Scottish Government's 2008 study assumed that alcohol was a key factor in 40% of violent offences (including serious assault, homicide, attempted murder, rape, attempted rape and minor assault). Based on our comparison of alcohol consumption patterns between Scotland and Northern Ireland in Section 4, we have assumed the same proportion of these violent offences is associated with alcohol in Northern Ireland.

7.4.3 Data Sources Used

In this area of the study, we have developed our cost estimates by making use of:

- Statistics published by the PSNI on Recorded Crimes and Clearances for 2008-09 (using crimes recorded as a measure of the Service's activity); and
- The PSNI Annual Report for 2008-09 (as a measure of the Service's overall operating cost).

7.4.4 Estimate of Alcohol-Related Cost

In 2008-09, the PSNI recorded a total of 110,094 crimes in Northern Ireland.

Within this overall figure, in line with the PSNI's standard classification of crimes, we have defined 'violent crime' as including the following offences:

Table 7.3: Violent Crime Recorded in Northern Ireland

Offence	Recorded Offences 2008-09
Murder	24
Manslaughter	2
Attempted murder	124
Threat or conspiracy to murder	2,104
Causing death or grievous bodily harm by dangerous driving or aggravated vehicle taking	67
Wounding with intent/grievous bodily harm with intent	791
Wounding/grievous bodily harm	935
Assault occasioning actual bodily harm	12,696
Common assault/aggravated assault	7,689
Assault on police	2,856
Intimidation	543
Harassment	1,456

Offence	Recorded Offences 2008-09
Other offences against the person	125
Rape	381
Attempted rape	23
Sexual assault/sexual activity	1,134
Exposure	270
Other sexual offences	135
Robbery	650
Armed robbery	508
Hijacking	125
Subtotal	**32,638**
Proportion assumed to relate to alcohol misuse	40%
RECORDED VIOLENT OFFENCES RELATED TO ALCOHOL	**13,055**

Source: PSNI Recorded Crimes and Clearances 2008-09 and FGS McClure Watters

If it is assumed that 40% of the above offences are related to alcohol as described above, then an estimated 13,055 violent crimes per annum would have an association with alcohol misuse. This represents some 11.9% of the total number of crimes recorded by the PSNI.

Based on this analysis, we have therefore assumed 11.9% of the overall activity of the PSNI relates to violent crime associated with alcohol.

In 2008-09, the PSNI's overall operating cost was some £838.3m. It should be noted that due to a variety of security and operational considerations, policing costs in Northern Ireland are likely to be higher per head of population than in other parts of the UK.

The Scottish Government's 2008 study indicated that, in 2006-07, the total cost of policing in Scotland was £1.06bn. This expenditure covered a population of some 5.1m people, representing a *per capita* cost of £206. In the same year in Northern Ireland, for a population of around 1.7m people, the PSNI's total operating cost (excluding exceptional items) was £814.7m, or £463 per head of population, more than twice the level experienced in Scotland.

On this basis, addressing violent crime related to alcohol would create an annual cost burden of around £99.7m**,** representing 11.9% of the PSNI's operating cost at 2008-09 prices (without any adjustment to reflect the relative degree of harm caused by alcohol misuse or other specific security and operational circumstances of policing in Northern Ireland).

Applying a notional 10% reduction to reflect the relative degree of harm caused by alcohol misuse in the Northern Ireland context produces a base case cost estimate of **£89.7m**.

7.4.5 Stratification and Sensitivity Analysis

We have classified the estimate above as **outline** as it is informed by assumptions on the proportion of violent crime which relates to alcohol misuse.

We have applied a general sensitivity in this area of +/-25% of the base estimate, producing a cost range of **£67.3m** to **£112.1m**.

7.5 Policing for Other Crime Partly Related to Alcohol

7.5.1 Description

As well as the violent offences discussed above, previous studies elsewhere in the UK have also drawn a link between alcohol misuse and other, non-violent crimes.

7.5.2 Methodology for Calculation

We approached the PSNI to request specific information on the number of other non-violent crimes recorded as being linked to alcohol misuse. However, the PSNI again indicated that it would not be able to provide data of the required completeness and quality in relation to the involvement of alcohol in these offences.

Due to limitations on the availability of specific data on the number of offences recorded as having a link to alcohol misuse, we have used information published by the PSNI regarding overall levels of recorded crime, and made assumptions on the proportion of recorded non-violent offences which are related to alcohol misuse.

In the Scottish Government's 2008 study, alcohol was assumed to be involved in 25% of non-violent offences. In line with the results of our comparison of alcohol consumption patterns between Scotland and Northern Ireland in Section 4, we have again assumed the same proportion of these offences is associated with alcohol in Northern Ireland.

7.5.3 Data Sources Used

As noted above, the PSNI recorded a total of 110,094 crimes in Northern Ireland in 2008-09, of which we have categorised some 32,638 (30%) as violent crimes in our analysis.

Based on similar studies elsewhere, we have assumed that, of the remaining 77,456 recorded crimes, 25% will have an association with alcohol misuse. This would equate to 19,364 crimes per annum on the basis of 2008-09 data, or 17.6% of the total number of crimes recorded in Northern Ireland.

From this analysis, we have assumed that 17.6% of the PSNI's overall activity relates to non-violent crimes which have linkages to alcohol misuse.

7.5.4 Estimate of Alcohol-Related Cost

Based on the analysis in preceding sections, dealing with other crime related to alcohol would generate annual outlay in the region of £147.5m**,** representing 17.6% of the PSNI's 2008-09 operating cost of £838.3m (without any adjustment for the relative degree of alcohol-related harm or particular operational and security requirements of policing in Northern Ireland).

Applying a notional 10% reduction to reflect the Northern Ireland context would produce a base case cost estimate of **£132.8m**.

7.5.5 Stratification and Sensitivity Analysis

As in our analysis of violent crime related to alcohol, we have classified the cost estimate in this area as **outline** as it is informed by assumptions on the proportion of violent crime which relates to alcohol misuse.

As with our work on violent crime related to alcohol, we have applied a general sensitivity of +/-25% around the base estimate, yielding a lower estimate of **£99.6m** and an upper estimate of **£165.9m**.

7.6 Summary of Cost Estimates – Fire and Police

The table below summarises our analysis of fire and police costs related to alcohol misuse:

Table 7.4: Summary of Cost Estimates – Fire and Police

Section	Cost Element	ANNUAL COST ESTIMATE			
		Firm or Outline	Base Case	Lower	Upper
			£m	£m	£m
7.2	Fire service callouts	Outline	**0.4**	0.3	0.5
7.3	Policing for alcohol-related crime	Outline	**0.7**	0.5	0.8
7.4	Policing for violent crime partly related to alcohol	Outline	**89.7**	67.3	112.1
7.5	Policing for other crime partly related to alcohol	Outline	**132.8**	99.6	165.9
	TOTAL ESTIMATED COST TO FIRE AND POLICE SERVICES		**223.6**	167.7	279.3

Our analysis in this area of the study has produced a base case cost estimate of some **£223.6m** per annum, without any adjustment to policing costs to reflect the specific operational and security circumstances of Northern Ireland.

It should be noted that the estimates our work has produced are highly sensitive to assumptions made on the proportions of violent and other crimes which are associated with alcohol. Applying sensitivity analysis for these and other factors generates a range of costs for fire and policing services between **£167.7m** and **£279.3m.**

Applying evidence from Scotland directly, without making allowances for the relative degree of harm caused by alcohol misuse in Northern Ireland, yields base case cost estimates as follows:

Table 7.4: Summary of Cost Estimates – Fire and Police (With and Without Adjustment)

Cost Element	With Adjustment £m	Without Adjustment £m
Fire service callouts	**0.4**	0.4
Policing for alcohol-related crime	**0.7**	0.7
Policing for violent crime partly related to alcohol	**89.7**	99.7
Policing for other crime partly related to alcohol	**132.8**	147.5
TOTAL ESTIMATED COST TO FIRE AND POLICE SERVICES	**223.6**	248.3

There is no significant difference in the figures reported if no adjustment is made for the relative degree of alcohol-related harm in Northern Ireland.

8 COST ANALYSIS – COURTS AND PRISONS

8.1 Introduction

This section of our report considers the additional costs to the Northern Ireland Courts and Tribunals Service (NICTS) and the Northern Ireland Prison Service (NIPS) which relate to alcohol misuse. Table 8.1 below presents the cost elements we have covered within this theme and also provides cross-references to our detailed work on each area of cost later in the section:

Table 8.1: Alcohol-Related Cost Elements within Courts and Prisons

Cost Element	Section
Court costs for violent crime related to alcohol	8.2
Court costs for other crime related to alcohol	8.3
Public prosecution costs for violent crime related to alcohol	8.4
Public prosecution costs for other crime related to alcohol	8.5
Legal Aid costs for violent crime related to alcohol	8.6
Legal Aid costs for other crime related to alcohol	8.7
Prison costs for violent crime related to alcohol	8.8
Prison costs for other crime related to alcohol	8.9

8.2 Court Costs for Violent Crime Related to Alcohol

8.2.1 Description

Court proceedings linked to offences associated with alcohol misuse will generate costs within the NICTS. In this section of the report, we examine expenditure associated with prosecutions for offences against the person and sexual offences.

8.2.2 Methodology for Calculation

We approached the NICTS to request specific data on whether alcohol was a significant factor in individual offences for which individuals were being prosecuted. However, we were informed that the NICTS does not record or collate information of this nature.

We have therefore instead sought to estimate the proportion of court prosecutions relating to offences related to alcohol misuse, and apply this percentage to the overall operating expenditure of the NICTS to produce estimates of court costs relating to alcohol misuse.

8.2.3 Data Sources Used

In examining these costs, we have used information from the Northern Ireland Court Service Annual Report and Resource Accounts for 2008-09 and statistics published by the NIO on court prosecutions and sentencing in Northern Ireland.

8.2.4 Estimate of Alcohol-Related Cost

In 2008-09, the Northern Ireland Court Service had an overall net operating cost of £149.9m, made up as follows:

Table 8.2: Analysis of Northern Ireland Court Service Net Operating Cost, 2008-09

Cost Element	2008-09 £m
Criminal court business	61.1
Civil court business	0.3
Legal Aid	87.0
Other	1.5
Net operating cost	**149.9**

Source: Northern Ireland Court Service Annual Report and FGS McClure Watters

We have focused our analysis on costs arising within the criminal courts as these will be the primary channels used for prosecutions involving alcohol-related offences (e.g. those of a violent or sexual nature).

The NICTS aims to achieve full cost recovery for the services it provides in respect of civil court business but incurred a small net deficit in this area in 2008-09. However, we have assumed that only a very small proportion of business transacted in the civil courts will be related to alcohol misuse and have not reflected this in our analysis.

Expenditure on Legal Aid, administered by the Legal Services Commission, covers both criminal and civil business, and is examined later in this chapter.

Table 8.3 below summarises the most recent information we were able to source from the NIO on the number and nature of criminal proceedings taken through the courts in Northern Ireland, and estimates the *pro rata* cost of each category of prosecution within the overall cost of the criminal courts in Northern Ireland:

Table 8.3: Composition of Court Prosecutions 2006

Crime Category	Pro Rata Cost	Prosecutions 2006	
	£m	%	Number
Offences against the person	6.0	9.9	3,095
Sexual offences	0.5	0.8	254
Robbery	0.4	0.6	182
Sub-total	**6.9**	**11.3**	**3,531**
Drink-driving offences	5.7	9.3	2,942
Other offences	48.5	79.4	24,901
TOTAL	**61.1**	**100**	**31,374**

Source: Northern Ireland Court Service Annual Report 2008-09, NIO Bulletin 12/2008, 'Court Prosecutions and Sentencing 2006' and FGS McClure Watters

From the analysis above, the NICTS incurs an estimated annual cost of £6.9m in relation to prosecutions for offences against the person, sexual offences and robbery. Assuming that 40% of these costs are associated with alcohol, as in other areas of the study, this would suggest that some £2.8m of expenditure arises in the NICTS in respect of prosecutions for offences against the person, robbery and sexual offences (expressed at 2008-09 prices).

Applying a notional 10% reduction to reflect the relative degree of harm caused by alcohol misuse in Scotland and Northern Ireland, this produces a base case cost estimate of some **£2.5m** per annum

8.2.5 Stratification and Sensitivity Analysis

Due to data limitations, we have again had to make assumptions on the proportion of violent and sexual offences relating to alcohol, so our cost estimate in this area should be viewed as **outline.**

As in our analysis of policing costs for alcohol-related offences in the preceding section, we have applied a general sensitivity of +/-25% around our base case figure, producing a lower estimate of **£1.9m** and a higher estimate of **£3.2m**.

8.3 Court Costs for Other Crime Related to Alcohol

8.3.1 Description

Here, we examine and estimate the costs which arise within the NICTS in respect of criminal prosecutions other than for offences against the person, robbery and sexual offences.

8.3.2 Methodology for Calculation

As detailed above, we initially approached the NICTS to request specific data on whether alcohol was a significant factor in individual offences for which individuals were being prosecuted, but the NICTS was unable to furnish us with the information requested.

We have therefore again made estimates of the proportion of court prosecutions relating to offences related to alcohol misuse, and applied this percentage to the overall operating expenditure of the NICTS to produce estimates of court costs relating to alcohol misuse.

8.3.3 Data Sources Used

We have used information from the Northern Ireland Court Service Annual Report and Resource Accounts for 2008-09 and statistics published by the NIO on court prosecutions and sentencing in Northern Ireland for our work in this section of the study.

8.3.4 Estimate of Alcohol-Related Cost

Table 8.3 above indicates that:

- The NICTS spends around £5.7m per annum on criminal prosecutions for drink-driving offences, based on specific data available to us. For the purposes of the study, we have assumed that 100% of this cost is alcohol-related, although we acknowledge that individual prosecutions may cover both drink-driving and other offences not related to alcohol misuse; and
- Some £48.5m a year is expended on criminal prosecutions for other non-violent offences. As in other areas of the review, we have assumed that 25% of these prosecutions are associated with alcohol (as reported in Scotland), equivalent to £12.1m of annual outlay. Applying a notional 10% reduction to this figure to reflect the relative degree of alcohol-related harm in Northern Ireland and Scotland yields an annual cost estimate of £10.9m in this area.

Taken together, the above analysis would suggest that the annual cost of alcohol misuse to the criminal courts for the prosecutions considered is some **£16.6m** at 2008-09 prices, after adjusting for the relative degree of harm caused by alcohol misuse in Northern Ireland.

8.3.5 Stratification and Sensitivity Analysis

Due to the use of assumptions in developing our cost estimates in this area, we have stratified them as **outline.**

We have not found it necessary to perform sensitivity analysis around our estimate of costs associated with drink-driving, as this is based on specific data supplied by the NICTS.

We have, however, applied a general sensitivity of +/-25% to examine the impact of variations in the assumptions we have made on the proportion of other non-violent criminal prosecutions considered in this section which relate to alcohol. This produces cost estimates ranging between **£13.9m** and **£19.3m**

8.4 Public Prosecution Costs for Violent Crime Related to Alcohol

8.4.1 Description

Prosecutions for alcohol-related offences will also generate costs within the Public Prosecution Service (PPS). The PPS is responsible for all criminal cases in Northern Ireland initiated or investigated by the police or other statutory authorities such as HM Revenue and Customs.

8.4.2 Methodology for Calculation

We approached the PPS directly to request specific data on whether alcohol was a significant factor in offences for which individuals were being prosecuted, but the PPS was not able to furnish us with the information requested.

We have therefore made estimates of the proportion of public prosecutions relating to offences related to alcohol misuse, and applied this percentage to the overall operating expenditure of the PPS to produce estimates of public prosecution costs relating to alcohol misuse.

8.4.3 Data Sources Used

We have used information from the PPS Annual Report for 2007-08 (uplifted to 2008-09 prices) and statistics published by the NIO on court prosecutions and sentencing in Northern Ireland for our work in this section of the study.

8.4.4 Estimate of Alcohol-Related Cost

In 2007-08, the PPS incurred annual operating expenditure of £34.8m. Uplifting this to 2008-09 by 2.52% (using the GDP deflator) produces restated operating costs of £35.7m per annum.

Our work in relation to the NICTS in Section 8.2 indicated that, of its annual operating expenditure of £61.1m in the criminal courts, some £2.8m (4.6%) could be attributed to violent offences linked to alcohol (offences against the person, sexual offences and robbery).

Using the same proportion for the overall cost of public prosecutions, this would suggest that annual costs of £1.6m arise within the PPS regarding prosecutions for violent offences linked to alcohol.

Applying a notional 10% reduction to reflect the Northern Ireland context yields a base case cost estimate of **£1.4m** per annum.

8.4.5 Stratification and Sensitivity Analysis

Due to the use of assumptions in developing our cost estimates in this area, we have stratified them as **outline.** We have applied a general sensitivity of +/-25%, which produces cost estimates ranging between **£1.1m** and **£1.8m**.

8.5 Public Prosecution Costs for Other Crime Related to Alcohol

8.5.1 Description

In this section of the report, we address the costs which arise within the PPS in respect of criminal prosecutions other than for offences against the person, robbery and sexual offences.

8.5.2 Methodology for Calculation

As detailed above, we initially approached the PPS to request specific data on whether alcohol was a significant factor in individual offences for which individuals were being prosecuted, but the PPS was not able to furnish us with the information requested.

We have therefore again made estimates of the proportion of court prosecutions relating to offences related to alcohol misuse, and applied this percentage to the overall operating expenditure of the PPS to produce estimates of public prosecution costs relating to alcohol misuse.

8.5.3 Data Sources Used

We have once more used information from the PPS Annual Report for 2007-08 (uplifted to 2008-09 prices) and statistics published by the NIO on court prosecutions and sentencing in Northern Ireland for our work in this section of the study.

8.5.4 Estimate of Alcohol-Related Cost

In 2007-08, the PPS incurred annual operating expenditure of £34.8m. Uplifting this to 2008-09 by 2.52% (using the GDP deflator) produces restated operating costs of £35.7m per annum.

Our work in relation to the NICTS in Section 8.2 indicated that, of its annual operating expenditure of £61.1m in the criminal courts, £17.8m (29%) could be attributed to violent offences linked to alcohol (offences against the person, sexual offences and robbery).

Using the above proportion for the overall cost of public prosecutions, this would suggest that annual costs of £10.4m arise within the PPS regarding prosecutions for violent offences linked to alcohol, before any adjustment for the relative degree of harm caused by alcohol misuse in Northern Ireland.

Applying a notional 10% reduction for the Northern Ireland context therefore yields a base case cost estimate of **£9.4m** a year in this area.

8.5.5 Stratification and Sensitivity Analysis

Due to the use of assumptions in developing our cost estimates in this area, we have stratified them as **outline.**

We have again applied a general sensitivity of +/-25% to examine the impact of variations in the assumptions we have made on the proportion of other non-violent criminal prosecutions considered in this section which relate to alcohol. This produces cost estimates ranging between **£7.1m** and **£11.8m**.

8.6 Legal Aid Costs for Violent Crime Related to Alcohol

8.6.1 Description

In order to ensure they have access to adequate legal representation, defendants in criminal court cases may be entitled to public financial assistance in the form of legal aid (for example, if they are at risk of going to jail or losing their job if found guilty of the offences of which they are accused).

Currently, there is free legal aid in all such criminal proceedings in Northern Ireland.

The Northern Ireland Legal Services Commission administers both criminal and civil legal aid in Northern Ireland, and is a non-departmental public body funded by the NICTS.

8.6.2 Methodology for Calculation

Our methodology for calculating our cost estimates in this area has included:

- Gathering information on the overall level of legal aid expenditure in Northern Ireland;
- Assessing the proportion of legal aid expenditure arising from criminal court proceedings; and
- Estimating the proportion of criminal legal aid expenditure which is associated with violent crime related to alcohol.

8.6.3 Data Sources Used

In making our cost estimates in this area, we have made use of data from the Northern Ireland Court Service 2008-09 financial statements regarding the overall level of expenditure on legal aid, as well as other information published on the NICTS website regarding the proportion of legal aid which relates to the criminal courts.

8.6.4 Estimate of Alcohol-Related Cost

In 2008-09, the Northern Ireland Court Service spent some £87m in relation to legal aid (administered through the Northern Ireland Legal Services Commission).

The NICTS has stated that criminal legal aid currently represents approximately 40% of the total legal aid budget. This suggests that, of the NICtS's annual £87m expenditure on legal aid, around £34.8m relates to criminal legal aid.

Our work in Section 8.2 above suggests that 11.3% of criminal court prosecutions relate to offences against the person, sexual offences and robbery. We have further assumed that 40% of these prosecutions are related to alcohol, drawing on the results of other recent UK

studies, assessed for relevance in the Northern Ireland context. Taken together, these figures indicate that 4.5% of criminal court prosecutions (40% of 11.3%) are for violent offences related to alcohol.

This therefore suggests that 4.5% of the NICTS's annual expenditure of £34.8m on criminal legal aid relates to violent crimes linked to alcohol. In monetary terms, this would equate to an annual cost (at 2008-09 prices) of some £1.6m, before any adjustment for factors specific to Northern Ireland.

Applying a notional 10% reduction to reflect the relative degree of harm caused by alcohol misuse in Northern Ireland produces a base case annual cost estimate of **£1.4m**.

8.6.5 Stratification and Sensitivity Analysis

The above is considered an **outline** estimate as we have had to make assumptions on the proportion of violent crime relating to alcohol, as in other areas of the study. We have therefore performed general sensitivity analysis around our base case estimate as follows, applying a margin of +/-25% to yield a lower estimate of **£1.1m** and a higher estimate of **£1.8m**.

8.7 Legal Aid Costs for Other Crime Related to Alcohol

8.7.1 Description

Criminal legal aid in Northern Ireland covers both violent offences and other crimes associated with alcohol misuse.

8.7.2 Methodology for Calculation

As in preceding sections, our methodology for making cost estimates in this area has included:

- Gathering information on the overall level of legal aid expenditure in Northern Ireland;
- Assessing the proportion of legal aid expenditure arising from criminal court proceedings; and
- Estimating the proportion of criminal legal aid expenditure which is associated with crime related to alcohol.

8.7.3 Data Sources Used

In this area of the study, we have again utilised data from the Northern Ireland Court Service 2008-09 financial statements regarding overall expenditure on legal aid, and supplementary information published on the NICTS website regarding the proportion of legal aid which relates to the criminal courts.

8.7.4 Estimate of Alcohol-Related Cost

In the preceding section of the report, we estimated that the NICTS currently spends around £34.8m a year on criminal legal aid in Northern Ireland.

Based on specific information from the NICTS, Table 8.3 above indicates that, of all court prosecutions:

- 9.3% relate to drink-driving offences (we have assumed all these prosecutions are associated with alcohol misuse and that defendants would be entitled to Legal Aid if at risk of losing their jobs on conviction); and
- 79.4% relate to other non-violent offences (as in other parts of the review, we have assumed 25% of these are connected to alcohol misuse, in other words, 19.9% of the total number of prosecutions).

Combining the above, we have assumed that some 29.2% of overall criminal court prosecutions for non-violent offences are associated with alcohol. Applying this proportion to the estimated expenditure of £34.8m on criminal legal aid would suggest that criminal legal aid to defendants for non-violent crime relating to alcohol accounts for around £10.1m of annual costs using 2008-09 prices, without any adjustment for the relative degree of harm caused by alcohol misuse in Northern Ireland.

Applying a notional 10% reduction for the Northern Ireland context would therefore generate a base case cost estimate of some **£9.1m** per annum.

8.7.5 Stratification and Sensitivity Analysis

We have stratified the above estimate as **outline** due to the role which assumptions play in its derivation.

We have not performed sensitivity analysis on the proportion of drink-driving offences relating to alcohol, as these are based on specific information provided by NICtS, but we have examined changes in the impact of the proportion of other offences assumed to relate to alcohol.

We have applied a general sensitivity of +/-25% to our base cost estimate of £9.1m relating to other non-violent crime which is associated with alcohol. This approach generates estimates ranging from a low of **£6.8m** to a high of **£11.4m.**

8.8 Prison Costs for Violent Crime Related to Alcohol

8.8.1 Description

A proportion of the NIPS's annual expenditure will relate to dealing with prisoners serving custodial sentences for offences related to alcohol. These sentences will cover a number of violent crimes identified as being closely associated with alcohol misuse, such as physical and sexual assaults.

8.8.2 Methodology for Calculation

We were informed by the Northern Ireland Office (NIO), of which the NIPS is an agency, that specific data are not currently available on whether alcohol was a significant factor in the offences for which prisoners are serving sentences.

In this area of the study, we have therefore instead sought to estimate the proportion of the prison population serving sentences for offences related to alcohol misuse, and apply this percentage to the overall operating expenditure of the NIPS to derive an estimate of prison costs relating to alcohol misuse.

8.8.3 Data Sources Used

In developing our cost estimates, we have made use of information from the NIPS's 2008-09 Annual Report regarding the Service's annual operating cost.

We have also reviewed statistics published by the NIO on the size and composition of the prison population during the 2008 calendar year.

8.8.4 Estimate of Alcohol-Related Cost

The size and composition of the average prison population for 2008 is set out in the table below:

Table 8.4: Northern Ireland Prison Population 2008

Prisoner Type	%	Number
Immediate custody	64	955
Remand	34	507
Fine defaulters	2	21
Non-criminal (e.g. immigration detainees)	-	6
TOTAL	**100**	**1,490**

Source: NIO Bulletin 5/2009, 'The Northern Ireland Prison Population in 2008'

The analysis above indicates that, on average, 98% of the prison population in Northern Ireland comprises individuals serving immediate custody sentences or on remand for criminal offences (other than fine default).

NIO statistics on the make-up of the prison population identify the number of immediate custody prisoners serving sentences for violent and sexual offences, as detailed in the table below:

Table 8.5: Composition of Immediate Custody Prisoner Population 2008

Principal Offence	%	Number
Violence against the person	41	393
Sexual offences	14	137
Robbery	13	124
Sub-total	**68**	**654**
Other offences	32	301
TOTAL	**100**	**955**

Source: NIO Bulletin 5/2009, 'The Northern Ireland Prison Population in 2008'

No similar breakdown was available for remand prisoners and we have therefore assumed that the above proportions also apply to the remand prisoner population.

The table below combines the results of the preceding analysis in estimating the overall percentage composition of the Northern Ireland prison population. In the absence of specific information for Northern Ireland, we have used the percentages identified as a proxy for the annual activity and costs the NIPS incurs for each category of prisoner:

Table 8.6: Estimated Percentage Composition of Overall Prison Population 2008

	Total %	Cost £m
Immediate custody and remand prisoners		
Violent/sexual offences and robbery	67	93.4
Other offences	31	43.3
Sub-total	**98**	**136.7**
Fine defaulters	2	2.0
Non-criminal prisoners	-	0.6
Total	**100**	**139.3**

Source: NIO Bulletin 5/2009, 'The Northern Ireland Prison Population in 2008' and FGS McClure Watters

From our analysis above, we estimate that the NIPS incurs some £93.4m of annual expenditure in relation to prisoners serving sentences for offences against the person, sexual offences and robbery. As for our work on policing, we have assumed that 40% of these offences are attributable to alcohol, based on the Scottish Government's 2008 study.

Based on the above, at 2008-09 prices, and before any adjustment for the relative degree of harm caused by alcohol misuse in Northern Ireland, this would suggest that violent and sexual offences linked to alcohol misuse generate annual prison costs of around £37.4m

(40% of the estimated overall cost of prisoners serving sentences for offences against the person, sexual offences and robbery).

Applying a notional 10% reduction for the Northern Ireland context would produce an annual base case cost estimate of **£33.7m** in this area.

8.8.5 Stratification and Sensitivity Analysis

As in other areas of our work on police and court costs, we have categorised the above estimate as **outline** since we have had to make a number of assumptions in developing it.

We have performed general sensitivity analysis of +/-25% around our base case estimate, yielding:

- A lower cost estimate of **£25.2m;** and
- A higher cost estimate of **£42.1m**.

8.9 Prison Costs for Other Crime Related to Alcohol

8.9.1 Description

As well as the more violent offenders discussed above, the NIPS will also incur a block of costs which relates to dealing with prisoners serving custodial sentences for other offences less strongly associated with alcohol.

8.9.2 Methodology for Calculation

As noted above, the NIO informed us that specific data are not currently available on whether alcohol was a significant factor in the offences for which prisoners are serving sentences.

We have therefore sought to estimate the proportion of the prison population serving sentences for non-violent offences related to alcohol misuse, and apply this percentage to the overall operating expenditure of the NIPS to produce a cost estimate for the purposes of the study.

8.9.3 Data Sources Used

For this area of our work, we have again worked with information from the NIPS's 2008-09 Annual Report regarding the Service's annual operating cost, and statistics published by the NIO on the size and composition of the prison population during 2008.

8.9.4 Estimate of Alcohol-Related Cost

Our analysis in Table 8.5 above suggests that the NIPS's annual expenditure on prisoners serving sentences other than for offences against the person, sexual offences and robbery is in the region of £43.3m per annum. As for our work on policing costs, we have assumed that 25% of these offences are attributable to alcohol (based on the Scottish Government's 2008

study, in the light of relative patterns of alcohol consumption between Scotland and Northern Ireland).

Based on the above, and before any adjustment for the relative degree of harm caused by alcohol misuse in Northern Ireland, handling prisoners serving sentences for these offences would generate annual costs within the NIPS of around £10.8m (25% of the estimated overall cost of prisoners serving sentences other than for offences against the person, sexual offences and robbery, expressed in 2008-09 prices).

Applying a notional 10% reduction to reflect the relative degree of harm caused by alcohol misuse in Northern Ireland produces a base case cost estimate of **£9.7m** per annum.

8.9.5 Stratification and Sensitivity Analysis

Our estimate of this cost element is classed as **outline** as its calculation has involved the use of assumptions in certain areas. We have therefore applied a general sensitivity of +/-25% around our base case estimate, producing a range from **£7.3m** to **£12.2m.**

8.10 Summary of Cost Estimates – Courts and Prisons

Table 8.7 below presents our cost estimates and sensitivity analysis in respect of courts and prisons:

Table 8.7: Summary of Cost Estimates – Courts and Prisons

Section	Cost Element	ANNUAL COST ESTIMATE			
		Firm or Outline	Base Case	Lower	Upper
			£m	£m	£m
8.2	Court costs for violent crime related to alcohol	Outline	**2.5**	1.9	3.2
8.3	Court costs for other crime related to alcohol	Outline	**16.6**	13.9	19.3
8.4	Public prosecution costs for violent crime related to alcohol	Outline	**1.4**	1.1	1.8
8.5	Public prosecution costs for other crime related to alcohol	Outline	**9.4**	7.1	11.8
8.6	Legal Aid costs for violent crime related to alcohol	Outline	**1.4**	1.1	1.8
8.7	Legal Aid costs for other crime related to alcohol	Outline	**9.1**	6.8	11.4
8.8	Prison costs for violent crime related to alcohol	Outline	**33.7**	25.2	42.1
8.9	Prison costs for other crime related to alcohol	Outline	**9.7**	7.3	12.2
	TOTAL ESTIMATED COST TO COURTS AND PRISONS		**83.8**	**64.4**	**103.6**

Our base case estimate of the annual costs arising in respect of courts and prisons is some **£83.8m,** of which the majority comprises the cost of prison sentences for offences associated with alcohol, and court prosecution costs for alcohol-related offences (other than offences against the person, sexual offences and robbery).

After sensitivity analysis, the range of values produced runs from **£64.4m** to **£103.6m**, and is influenced by the assumptions made on the proportions of court cases and prison sentences which are connected with alcohol misuse.

Table 8.8 below sets out the cost estimates arising if evidence from Scotland is applied directly without making any adjustment for the relative degree of alcohol-related harm in Northern Ireland:

Table 8.8: Summary of Cost Estimates – Courts and Prisons (With and Without Adjustment)

Cost Element	With Adjustment	Without Adjustment
	£m	£m
Court costs for violent crime related to alcohol	**2.5**	2.8
Court costs for other crime related to alcohol	**16.6**	17.8
Public prosecution costs for violent crime related to alcohol	**1.4**	1.6
Public prosecution costs for other crime related to alcohol	**9.4**	10.4
Legal Aid costs for violent crime related to alcohol	**1.4**	1.6
Legal Aid costs for other crime related to alcohol	**9.1**	10.1
Prison costs for violent crime related to alcohol	**33.7**	37.4
Prison costs for other crime related to alcohol	**9.7**	10.8
TOTAL ESTIMATED COST TO COURTS AND PRISONS	**83.8**	**92.5**

The cost estimates produced do not vary significantly if no adjustment is made for circumstances specific to the Northern Ireland context.

9 COST ANALYSIS – WIDER ECONOMY

9.1 Introduction

In addition to the areas examined in preceding sections of the report, alcohol misuse can generate a range of cost impacts in other areas of the wider economy. Table 9.1 below sets out the cost elements we have covered within this theme, along with cross-references to our detailed work on each area of cost later in the section:

Table 9.1: Alcohol-Related Cost Elements within the Wider Economy

Cost Element	Section
Presenteeism at work	9.2
Absenteeism from work	9.3
Unemployment	9.4
Premature mortality among people of working age	9.5

Due to constraints on the availability of information, costs in relation to the value of lost 'unwaged' output such as housework and volunteering have not been estimated in this section.

9.2 Presenteeism at Work

9.2.1 Description

Alcohol misuse may contribute to higher levels of 'presenteeism' at work, defined as reduced activity and output among employees who show up for work while suffering from the effects of excessive alcohol consumption.

9.2.2 Methodology for Calculation

Specific data are not available on the value of economic output lost due to presenteeism at work, in Northern Ireland, England or Scotland.

As an alternative, we have identified the total value of economic activity in Northern Ireland and workforce hours in Northern Ireland, and made assumptions on the proportion of potential working hours lost to presenteeism, in the light of similar studies of alcohol misuse in Scotland and England.

9.2.3 Data Sources Used

In making our estimates of costs, we have made use of source data from ONS on economic activity in Northern Ireland and from the Department of Enterprise, Trade and Investment (DETI) on average weekly hours worked.

9.2.4 Estimate of Alcohol-Related Cost

Studies conducted by the Scottish Government in 2008 and 2010 estimated that, on average, people in employment turned up for work with a hangover 2.5 days a year, and were 27% less productive than normal on those days.

In the light of evidence available regarding the prevalence and intensity of alcohol consumption in Northern Ireland and Scotland, we have assumed that workers here will also turn up for work hung-over an average of 2.5 days per year, and still suffer a 27% reduction in productivity on the days in question. Taken together, these figures suggest that workers in Northern Ireland lose an average of 0.68 days of output per annum as a result of presenteeism (27% reduction for 2.5 days per year).

DETI statistics estimated that some 765,000 people were in employment in Northern Ireland in June 2008. On the assumption that each employee loses an average of 0.68 days' productivity each year as a result of hangovers, this would suggest that some 520,200 working days are lost to presenteeism each year. Assuming an average seven-hour working day, this would translate into some 3.64m working hours' worth of output per annum.

DETI statistics also indicate that the total workforce hours worked per week in Northern Ireland in 2008 was 26 million. Extrapolating this figure over a 52-week year would yield an annual figure of some 1.35 billion workforce hours.

On this basis, the estimated number of annual workforce hours lost to presenteeism would therefore represent 0.3% of total annual workforce hours in Northern Ireland.

ONS reports that in 2008, economic activity in Northern Ireland, as measured by Gross Value Added (GVA), was some £28.7bn. Losing 0.3% of this output due to the effects of presenteeism would represent an annual cost to the economy of £86.1m at 2008-09 prices, before any adjustment for the degree of alcohol-related harm in Northern Ireland relative to Scotland and England.

Applying a notional 10% reduction to reflect the relative degree of alcohol-related harm in Northern Ireland would produce a base case annual cost estimate of **£77.5m.**

9.2.5 Stratification and Sensitivity Analysis

This is an **outline** cost estimate as we have found it necessary to make assumptions on the number of days in the year that employees will come into work hung-over.

Applying a general sensitivity of +/-25% to the base case estimate above produces a range from **£58.1m** to **£96.9m.**

9.3 Absenteeism from Work

9.3.1 Description

In addition to employees turning up for work but being less productive due to the effects of alcohol misuse, other costs to the economy and society will arise where individuals are absent from their place of work on account of excessive alcohol consumption.

9.3.2 Methodology for Calculation

As is the case for presenteeism, no specific data are available on the value of economic output lost due to alcohol-related absenteeism, in Northern Ireland, Scotland or England.

Instead, we have identified the total value of economic activity in Northern Ireland and workforce hours in Northern Ireland, and made assumptions on the proportion of potential working hours lost to alcohol-related absenteeism, drawing on evidence from other recent UK studies.

9.3.3 Data Sources Used

In making our estimates of costs, we have again utilised source data from ONS on economic activity in Northern Ireland and from the Department of Enterprise, Trade and Investment (DETI) on average weekly hours worked and rates of sickness absence.

9.3.4 Estimate of Alcohol-Related Cost

DETI's Labour Force Survey suggests that 1.1% of working days in Northern Ireland are lost each year to sickness absence.

The Cabinet Office's 2003 study of alcohol misuse in England suggested that between 6% and 15% of sickness absence days are associated with alcohol-related illnesses. We have assumed that 10.5% of sickness absence days here are related to alcohol, representing the midpoint of the range estimated for England.

Taking the above together, we estimate that 0.12% of working days in Northern Ireland are lost each year due to alcohol-related sickness.

As noted above, ONS reported that, in 2008, economic activity in Northern Ireland was valued at £28.7bn. If the local economy loses 0.12% of working days for absences related to alcohol, this would produce an annual cost of **£33.1m** at 2008-09 prices.

Since our estimate in this area is based on specific data for Northern Ireland rather than assumptions based on evidence from Scotland, we have not applied any notional reduction to reflect differences in the degree of harm caused by alcohol misuse.

9.3.5 Stratification and Sensitivity Analysis

Again, our cost estimate in this area has been stratified as **outline** due to the need to make assumptions in the course of our work.

We have conducted sensitivity analysis on these costs based on evidence from England and Scotland on variations in the degree of alcohol-related absenteeism in the workplace. If we assume that 6% of sickness absence is related to alcohol misuse, this would translate to an annual loss of 0.066% of working days, or **£18.9m** in terms of GVA. An assumption that 15% of sickness absence is related to alcohol would suggest that 0.165% of working days are lost each year in Northern Ireland, which would amount to **£47.4m** of the region's GVA.

9.4 Unemployment

9.4.1 Description

In addition to the issues of alcohol-related absenteeism and presenteeism, it is likely that patterns of alcohol misuse may contribute to individuals being unemployed.

While there is no definitive relationship between alcohol consumption and unemployment, the Cabinet Office's 2003 study suggested there is evidence that excessive drinking is negatively associated with employment.

9.4.2 Methodology for Calculation

We understand that no specific data are available in any of the UK jurisdictions regarding the cost of alcohol misuse in terms of unemployment.

We have therefore worked with evidence from previous studies, adjusted for population size, overall unemployment rates and estimated patterns of alcohol misuse.

9.4.3 Data Sources Used

We have used population figures produced by ONS in deriving our cost estimates in this area.

9.4.4 Estimate of Alcohol-Related Cost

The Scottish Government's 2010 study suggested the economic cost of unemployment related to alcohol misuse in Scotland was some £171.2m per year. For the country's population of 5.1m, this would represent an annual per capita cost of £33.56. We have uplifted this 2007 figure by 2.52% to reflect 2008-09 price levels within our analysis, yielding a revised cost of £34.41.

Reported unemployment rates for October 2009 were very similar for both Scotland (6.9%) and Northern Ireland (6.6%), so we have not found it necessary to make adjustments in respect of relative levels of unemployment.

Data published by ONS indicate that median gross weekly earnings in Northern Ireland are currently £356.70, some 9% lower than the corresponding figure of £385.40 in Scotland. Based on this income differential, we have assumed a further 9% reduction in the per capita cost in Northern Ireland compared to Scotland, to £31.31.

For Northern Ireland's population of 1.8m, this would produce an estimated annual economic cost of £55.6m arising from unemployment linked to alcohol misuse, before any adjustment for the degree of alcohol-related harm relative to levels in Scotland.

Applying a notional 10% reduction to reflect the degree of harm caused by alcohol misuse in Northern Ireland produces a base case annual cost estimate of **£50.0m.**

9.4.5 Stratification and Sensitivity Analysis

We have classified this estimate as **outline** due to the necessity of using assumptions in its development.

We have therefore applied a general sensitivity of +/-25% to generate a range of values between **£37.5m** and **£62.5m** per year for the social cost of alcohol-related unemployment.

9.5 Premature Mortality among People of Working Age

9.5.1 Description

Alcohol-related deaths among people of working age can lead to an economic cost in terms of the value of production lost as a result of premature mortality.

9.5.2 Methodology for Calculation

NISRA's mortality statistics for 2008 reported that there were 276 alcohol-related deaths in Northern Ireland during that year, analysed as follows:

Table 9.2: Alcohol-Related Deaths in Northern Ireland, 2008

Sex	All Ages	15-34	35-54	55-74	75+
Male	**185**	4	90	83	8
Female	**91**	2	46	40	3
Total	**276**	**6**	**136**	**123**	**11**

Source: NISRA Mortality Statistics for Northern Ireland 2008

Assuming (as per the 2010 Scottish study) that all deaths occur at the midpoint within each age band and that both men and women retire at 65 years of age, the total number of potential working years lost is estimated as follows:

Table 9.3: Years of Working Life Lost through Alcohol-Related Deaths, 2008

Sex	All Ages	15-34	35-54	55-74	75+
Male – alcohol-related deaths	**185**	4	90	83	8
Midpoint of age range		25	45	65	-
Years of working life lost per individual up to age 65		40	20	-	-
Total years of working life lost – males		**160**	**1,800**	**-**	**-**
Female – alcohol-related deaths	**91**	2	46	40	3
Midpoint of age range		25	45	65	-
Years of working life lost per individual up to age 65		40	20	-	-
Total years of working life lost – females		**80**	**920**	**-**	**-**
Total years of working life lost – males and females	**2,960**	**240**	**2,720**	**-**	**-**

Source: NISRA Mortality Statistics for Northern Ireland 2008 and FGS McClure Watters

9.5.3 Data Sources Used

Within our analysis, we have made use of data from NISRA regarding alcohol-related deaths in Northern Ireland and information from DETI concerning unemployment and average earnings.

9.5.4 Estimate of Alcohol-Related Cost

Our analysis above suggests that some 2,960 years of potential working life are lost per annum in Northern Ireland through deaths related to alcohol misuse (1,960 for men and 1,000 for women).

Not all people of working age who die through alcohol misuse will be in full-time employment. Our analysis of alcohol-related unemployment above noted that current overall rates of unemployment are comparable in Scotland and Northern Ireland. As in the 2010 Scottish study, we have therefore assumed future employment rates of 80.2% for males and 60.8% for females. This would imply that for males, 1,607 working years are lost per annum (80.2% of 1,960 potential years) and for females, 608 working years per annum (60.8% of 1,000 potential years). This yields a total of 2,215 working years lost per annum due to alcohol misuse.

Data published by ONS indicate that median gross weekly earnings in Northern Ireland are currently £356.70, equivalent to £18,548 for a 52-week working year.

Overall, we estimate that the cost of alcohol-related premature mortality in Northern Ireland is in the region of **£41.1m,** based on the analysis above, representing 2,215 working years lost at a median average annual salary of £18,548.

Since our estimate in this area is based on specific data for Northern Ireland rather than assumptions based on evidence from Scotland, we have not applied any notional reduction to reflect differences in the degree of harm caused by alcohol misuse.

9.5.5 Stratification and Sensitivity Analysis

Again, due to the need to make assumptions in this area of our work, we have classified this cost estimate as **outline**. Applying a general margin of error of +/-25% generates a low estimate of **£30.8m** and a high-end estimate of **£51.4m.**

9.6 Summary of Cost Estimates – Wider Economy

Table 9.4 below presents our analysis of wider economic costs. Our base case estimate in this area is an annual cost of **£201.7m**, within a range of **£145.3m-£258.2m**.

The principal components of cost in this area are reduced productivity at work and premature mortality among people of working age, and the estimate presented is again sensitive to variations in assumptions on the impact of alcohol misuse on the wider economy.

Table 9.4: Summary of Cost Estimates – Wider Economy

Section	Cost Element	Firm or Outline	ANNUAL COST ESTIMATE		
			Base Case	Lower	Upper
			£m	£m	£m
9.2	Presenteeism at work	Outline	**77.5**	58.1	96.9
9.3	Absenteeism from work	Outline	**33.1**	18.9	47.4
9.4	Unemployment	Outline	**50.0**	37.5	62.5
9.5	Premature mortality among people of working age	Outline	**41.1**	30.8	51.4
	TOTAL ESTIMATED COST TO WIDER ECONOMY		**201.7**	**145.3**	**258.2**

We have examined the impact of not making any adjustment for the relative degree of alcohol-related harm in Northern Ireland, and instead applying evidence from Scotland directly, as shown in the table below:

Table 9.5: Summary of Cost Estimates – Wider Economy (With and Without Adjustment)

Cost Element	With Adjustment	Without Adjustment
	£m	£m
Presenteeism at work	**77.5**	86.1
Absenteeism from work	**33.1**	33.1
Unemployment	**50.0**	55.6
Premature mortality among people of working age	**41.1**	41.1
TOTAL ESTIMATED COST TO WIDER ECONOMY	**201.7**	**215.9**

It can be seen that the results of our analysis do not differ significantly if no adjustment is made for the Northern Ireland context.

10 OVERALL COST ANALYSIS

10.1 Summary of Analysis

In overall terms, we estimate that the social cost of alcohol misuse in Northern Ireland is between £500.8m and £881.1m per annum, with a base case estimate of some **£679.8m**.

The table below brings together the overall results of our analysis of costs arising within healthcare, social work, the fire and police services, courts and prisons and the wider economy:

Table 10.1: Overall Summary of Cost Estimates

Section	Cost Element	ANNUAL COST ESTIMATE		
		Base Case	Lower	Upper
		£m	£m	£m
5	Healthcare	**122.2**	89.8	158.0
6	Social work	**48.5**	33.6	82.0
7	Fire and police	**223.6**	167.7	279.3
8	Courts and prisons	**83.8**	64.4	103.6
9	Wider economic costs	**201.7**	145.3	258.2
	TOTAL ESTIMATED COST OF ALCOHOL MISUSE	**679.8**	500.8	881.1

10.2 Healthcare

We examined the costs arising from alcohol misuse within health and social care, across the spectrum of primary care, acute and psychiatric hospitals and community care services.

The costs identified are summarised in the table below and explored in detail in Section 5:

Table 10.2: Summary of Cost Estimates – Healthcare

Section	Cost Element	ANNUAL COST ESTIMATE			
		Firm or Outline	Base Case	Lower	Upper
			£m	£m	£m
5.2	GP-prescribed drugs	Firm	**0.3**	0.3	0.3
5.3	GP/practice nurse consultations attributable to alcohol	Outline	**9.3**	4.6	14.0
5.4	Laboratory testing in primary care	Outline	**0.1**	0.1	0.1
5.5	Hospitalisation days – acute	Firm	**65.5**	60.0	72.1
5.6	Hospitalisation days – mental illness	Outline	**8.6**	6.5	10.8
5.7	A&E attendances	Outline	**16.6**	1.3	30.5
5.8	Outpatient hospital visits	Outline	**5.2**	4.8	5.4
5.9	Day hospital visits – mental illness	Outline	**<0.1**	<0.1	<0.1
5.10	Day hospital visits – non-mental illness	Firm	**1.9**	1.7	2.1
5.11	Community psychiatric teams	Outline	**4.2**	3.2	5.3
5.12	Health promotion	Firm	**0.4**	0.3	0.4
5.13	Drug and Alcohol Coordination Teams	Outline	**3.5**	2.6	4.3
5.14	Ambulance journeys	Outline	**6.5**	4.3	12.6
	TOTAL ESTIMATED COST TO HEALTHCARE		**122.2**	**89.8**	**158.0**

10.3 Social Work

In relation to additional costs arising within social work, we examined the expenditure incurred by Health and Social Care Trusts in delivering services to children and families, as well as costs within the Youth Justice Agency and Probation Board for Northern Ireland associated with alcohol misuse.

Table 10.3: Summary of Cost Estimates – Social Work

Section	Cost Element	ANNUAL COST ESTIMATE			
		Firm or Outline	Base Case	Lower	Upper
			£m	£m	£m
6.2	Children and family services	Outline	**36.9**	23.1	69.2
6.3	Youth justice	Firm	**3.6**	3.3	4.0
6.4	Criminal justice social work	Firm	**8.0**	7.2	8.8
	TOTAL ESTIMATED COST TO SOCIAL WORK		**48.5**	**33.6**	**82.0**

Section 6 of the report provides greater detail in this area.

10.4 Fire and Police

The Northern Ireland Fire and Rescue Service and the Police Service of Northern Ireland incur a range of costs in responding to incidents which have a connection with alcohol misuse. Our estimates of these costs are summarised below and considered further in Section 7 of the report.

Table 10.4: Summary of Cost Estimates – Fire and Police

Section	Cost Element	ANNUAL COST ESTIMATE			
		Firm or Outline	Base Case	Lower	Upper
			£m	£m	£m
7.2	Fire service callouts	Outline	**0.4**	0.3	0.5
7.3	Policing for alcohol-related crime	Outline	**0.7**	0.5	0.8
7.4	Policing for violent crime partly related to alcohol	Outline	**89.7**	67.3	112.1
7.5	Policing for other crime partly related to alcohol	Outline	**132.8**	99.6	165.9
	TOTAL ESTIMATED COST TO FIRE AND POLICE SERVICES		**223.6**	167.7	279.3

10.5 Courts and Prisons

Criminal offences relating to alcohol misuse will have cost implications within the Northern Ireland Court Service, the Northern Ireland Legal Services Commission (in respect of Legal Aid) and the Northern Ireland Prison Service.

Our estimates of these costs are summarised in Table 10.5 below and set out in more depth in Section 8 of the report.

Table 10.5: Summary of Cost Estimates – Courts and Prisons

Section	Cost Element	ANNUAL COST ESTIMATE			
		Firm or Outline	Base Case	Lower	Upper
			£m	£m	£m
8.2	Court costs for violent crime related to alcohol	Outline	**2.5**	1.9	3.2
8.3	Court costs for other crime related to alcohol	Outline	**16.6**	13.9	19.3
8.4	Public prosecution costs for violent crime related to alcohol	Outline	**1.4**	1.1	1.8
8.5	Public prosecution costs for other crime related to alcohol	Outline	**9.4**	7.1	11.8
8.6	Legal Aid costs for violent crime related to alcohol	Outline	**1.4**	1.1	1.8
8.7	Legal Aid costs for other crime related to alcohol	Outline	**9.1**	6.8	11.4
8.8	Prison costs for violent crime related to alcohol	Outline	**33.7**	25.2	42.1
8.9	Prison costs for other crime related to alcohol	Outline	**9.7**	7.3	12.2
	TOTAL ESTIMATED COST TO COURTS AND PRISONS		**83.8**	**64.4**	**103.6**

10.6 Wider Economic Costs

As well as the costs incurred across the public services as a result of alcohol misuse, other financial impacts are likely to arise in terms of the economic output lost due to absenteeism, underperformance, unemployment and premature mortality among people of working age. Our cost estimates in this area are summarised in Table 10.6 below and explored further in Section 9:

Table 10.6: Summary of Cost Estimates – Wider Economy

Section	Cost Element	ANNUAL COST ESTIMATE			
		Firm or Outline	Base Case	Lower	Upper
			£m	£m	£m
9.2	Presenteeism at work	Outline	**77.5**	58.1	96.9
9.3	Absenteeism from work	Outline	**33.1**	18.9	47.4
9.4	Unemployment	Outline	**50.0**	37.5	62.5
9.5	Premature mortality among people of working age	Outline	**41.1**	30.8	51.4
	TOTAL ESTIMATED COST TO WIDER ECONOMY		**201.7**	**145.3**	**258.2**

While our analysis in Section 3 of the study highlighted the potential difficulties in comparing the results of individual COI studies across time and between different countries, it is nonetheless interesting to make some comparisons between the cost figures we have derived for Northern Ireland and the findings of recent alcohol misuse studies in Scotland and England:

- The Scottish Government's 2010 study identified £2.09bn of costs (at 2006-07 prices) arising from the areas covered in this study. Restating these costs to 2008-09 prices yields a cost figure of £2.14bn, equivalent to £420 per head for the country's 5.1m population. Across the Northern Ireland population of 1.8m, the costs we have identified of £679.8m would represent a per capita cost of £378 per head; and

- Within healthcare, the 2010 Scottish study identified a base case cost of £267.8m (£274.5m at 2008-09 prices), reflecting a per-capita cost of £54. The English Department of Health has estimated that the cost of alcohol harm to the NHS in England was £2.7bn (at 2006-07 prices). This is equivalent to £2.85bn at 2008-09 prices and, based on a population of 51.4m, would be equivalent to £55 per head of population. Our analysis for Northern Ireland identifies alcohol-related costs to the health service of £122.2m, or some £68 per head based on a population of 1.8m. An element of this differential may relate to diseconomies of scale in the Northern Ireland context.

In addition, a study carried out by DHSSPS in 1998[59], using an alternative methodology and examining a different range of themes, estimated that the annual social costs of alcohol-related harm were in the region of £337m at 1997-98 prices (excluding £440.7m relating to the intrinsic value of premature deaths, which has not been included in the scope of work agreed with the Department for this study). Uplifting the figure of £337m by 30% using GDP deflators to reflect 2008-09 prices would produce a restated figure of £438m. While at first sight this would indicate that alcohol misuse currently carries a higher cost in Northern Ireland

[59] DHSSPS (1998), 'The Social Costs of Alcohol-Related Harm in Northern Ireland'

than in 1998, there are a number of significant caveats surrounding the comparability of cost estimates in different studies, as noted earlier in the report.

10.7 Exclusion of Adjustment for Northern Ireland Context

Table 10.7 below summarises our base case cost analysis across each of the key themes identified, both with and without the notional adjustment for the relative degree of alcohol-related harm in Northern Ireland when considered alongside Scotland:

Table 10.7: Overall Summary of Cost Estimates (With and Without Adjustment)

Section	Cost Element	With Adjustment £m	Without Adjustment £m
5	Healthcare	**122.2**	127.8
6	Social work	**48.5**	52.6
7	Fire and police	**223.6**	248.3
8	Courts and prisons	**83.8**	92.5
9	Wider economic costs	**201.7**	215.9
	TOTAL ESTIMATED COST OF ALCOHOL MISUSE	**679.8**	737.1

The figures reported do not vary significantly between the two scenarios above and in fact show a difference of 8.4%.

APPENDIX 1

LITERATURE SEARCH STRATEGY

Y O R K

Health Economics

C O N S O R T I U M

Cost of illness: alcohol in Northern Ireland

Literature search

Draft report

JULIE GLANVILLE, Project Director – Information Services

Oct 23 2009

University of York, Market Square, Vanbrugh Way, Heslington, York YO10 5NH

Tel: 01904 433620 Fax: 01904 433628 Email: yhec@york.ac.uk http://www.yhec.co.uk

THE UNIVERSITY of York

Objectives

The objective of the searches was to identify recent research into cost of illness methods *and evidence on the benefits of alcohol use.*

Methods

This search was designed to identify papers about cost of illness methods by searching for search terms which would identify the general concept of cost of illness. Identifying methods publications is challenging largely due to papers about methodological developments or review of methods not being apparent from the words in the title or abstract of the paper. Even where 'methodological development' or overview is indicated by the use of the words such as 'methods' or 'review' there irrelevant records are still likely to be retrieved because those words are commonly used to describe research studies of many types. The impact of this lack of clarity is that the search is not very focused and records needed to be scanned to assess which focus on methodological development, or review methods issues. It is likely that some reports of specific cost of illness projects may also contain reviews of methods and introduce methodological developments – so selected examples have been included.

The focus of the project is on recent methods developments so the search results were limited to publications since 1999, i.e. the last ten years. The brief timescale meant that we focused on English language papers only.

Databases searched for recent research into cost of illness methods.

The databases searched are listed in Table 1. These databases provide access to a range of relevant literatures:

- economic methods (Econlit);
- health policy and management (HMIC)
- general health and medicine (MEDLINE).
- grey literature in economics (REPEC resource for economic working papers)
- grey literature all topics (OAISTER: union catalogue of digital resources providing access to millions of academic, governmental and research organization publications, many of which are not indexed in the major bibliographic databases).

Table 1. Databases searched for cost of illness methods publications

Database	Publisher	Coverage	Search date
Econlit	Ovid	1969 – Sept 2009	28/9/9

HMIC	Ovid	To Sept 2009	28/9/9
MEDLINE	Ovid	1950 to Sept 25 2009	28/9/9
OAISTER	http://quod.lib.umich.edu/cgi/b/bib/bib-idx?c=oaister;page=simple		28/9/9
REPEC/IDEAS	http://repec.org/		28/9/9

In addition to database searches we have also conducted citation searches of some methods papers (see 2.2. below), to identify publications which have cited them and which may, in turn, report methods developments. We have also searched selected relevant websites:

WHO Global Burden of Disease' programme website (http://www.who.int/topics/global_burden_of_disease/en/), searched 28/9/9. This website focuses on disease rather than risk factors for disease.

WHO alcohol website (http://www.who.int/topics/alcohol_drinking/en/), searched 28/9/9.

WHO publications page was searched using the search term 'cost of illness' on 28/9/9: http://www.who.int/substance_abuse/publications/alcohol/en/index.html

Search strategies for recent research into cost of illness methods.

The search strategies used for the database searches were designed to capture cost of illness methods as far as possible, although, as noted above, this is problematic. The approach used focuses on searches of words in the title and abstract (textwords) rather than indexing terms offered by the database producers. The MEDLINE database offers a subject indexing term COST OF ILLNESS but this generates over 10,000 records which means that it is unhelpful for a focused search. The search strategies are presented below.

ECONLIT

1 ((cost or costs or costing or intangible value$) adj (illness$ or behav$)).ti,ab. (32)

2 ((cost or costs or costing) adj alcohol$ adj4 (team$ or prevention$ or education$ or outpatient$ or risk$ or premature death$)).ti,ab. (0)

3 ((cost or costs or costing) adj alcohol$ adj4 (admission$ or health$ or society or social or criminal or crime$)).ti,ab. (1)

4 ((cost or costs or costing) adj alcohol$ adj4 (social work or fire or fires or human or hospital$ or nhs or care)).ti,ab. (1)

5 ((cost or costs or costing) adj alcohol$ adj4 (harm$ or scotland or scottish or accident$ or emergenc$ or psychiatr$)).ti,ab. (0)

6 ((cost or costs or costing) adj alcohol$ adj4 (children or community or detox or withdrawal or treatment or judicial)).ti,ab. (0)

7 ((cost or costs or costing) adj alcohol$ adj4 (hearing$ or probation$ or home care or offend$ or police or court$)).ti,ab. (0)

8 ((cost or costs or costing) adj alcohol$ adj4 (hearing$ or probation$ or home care or offend$ or police or court$)).ti,ab. (0)

9 ((cost or costs or costing) adj alcohol$ adj4 (domestic abuse or assault$ or rape or murder$ or drunkenness)).ti,ab. (0)

10 ((cost or costs or costing) adj alcohol$ adj4 (prison$ or fire$ or absenteeism or presenteeism or lost productivity)).ti,ab. (0)

11 ((cost or costs or costing) adj alcohol$ adj4 (unemploy$ or premature mortality or lost productivity or human capital or victim$)).ti,ab. (0)

12 ((impact or effect$ or size or scope) adj alcohol$ adj (health$ or society or social or Scotland or criminal or harm$)).ti,ab. (0)

13 alcohol attributable fraction$.ti,ab. (0)

14 ((proportion$ or percentage$) adj3 alcohol$).ti,ab. (2)

15 (willingness adj2 pay adj5 (suffering or avoid or death$ or avert or preventable)).ti,ab. (48)

16 (value adj2 year adj2 life).ti,ab. (1)

17 (human value adj3 death).ti,ab. (0)

18 (human value adj3 disability).ti,ab. (0)

19 ((valuing or valuation) adj2 benefits).ti,ab. (62)

20 or/1-19 (146)

21 (burden adj3 (illness$ or disease$)).ti,ab. (93)

22 21 not 20 (93)

23 limit 22 to yr="2000 -Current" (67)

24 ((cost or costs or costing or intangible value$) adj3 illness$).ti,ab. (127)

25 limit 24 to yr="2000 -Current" (92)

26 27 not (20 or 23) (88)

The search results in sets 20, 23 and 26 were assessed for relevance and relevant records were downloaded.

HMIC

1 ((cost or costs or costing or intangible value$) adj (illness$ or behav$)).ti,ab. (69)

2 ((cost or costs or costing) adj alcohol$ adj4 (team$ or prevention$ or education$ or outpatient$ or risk$ or premature death$)).ti,ab. (0)

3 ((cost or costs or costing) adj alcohol$ adj4 (admission$ or health$ or society or social or criminal or crime$)).ti,ab. (4)

4 ((cost or costs or costing) adj alcohol$ adj4 (social work or fire or fires or human or hospital$ or nhs or care)).ti,ab. (0)

5 ((cost or costs or costing) adj alcohol$ adj4 (harm$ or scotland or scottish or accident$ or emergenc$ or psychiatr$)).ti,ab. (2)

6 ((cost or costs or costing) adj alcohol$ adj4 (children or community or detox or withdrawal or treatment or judicial)).ti,ab. (2)

7 ((cost or costs or costing) adj alcohol$ adj4 (hearing$ or probation$ or home care or offend$ or police or court$)).ti,ab. (0)

8 ((cost or costs or costing) adj alcohol$ adj4 (hearing$ or probation$ or home care or offend$ or police or court$)).ti,ab. (0)

9 ((cost or costs or costing) adj alcohol$ adj4 (domestic abuse or assault$ or rape or murder$ or drunkenness)).ti,ab. (0)

10 ((cost or costs or costing) adj alcohol$ adj4 (prison$ or fire$ or absenteeism or presenteeism or lost productivity)).ti,ab. (1)

11 ((cost or costs or costing) adj alcohol$ adj4 (unemploy$ or premature mortality or lost productivity or human capital or victim$)).ti,ab. (0)

12 ((impact or effect$ or size or scope) adj alcohol$ adj (health$ or society or social or Scotland or criminal or harm$)).ti,ab. (0)

13 alcohol attributable fraction$.ti,ab. (2)

14 ((proportion$ or percentage$) adj3 alcohol$).ti,ab. (15)

15 (willingness adj2 pay adj5 (suffering or avoid or death$ or avert or preventable)).ti,ab. (2)

16 (value adj2 year adj2 life).ti,ab. (1)

17 (human value adj3 death).ti,ab. (0)

18 (human value adj3 disability).ti,ab. (0)

19 ((valuing or valuation) adj2 benefits).ti,ab. (23)

20 (burden adj3 (illness$ or disease$)).ti,ab. (339)

21 or/1-20 (447)

22 limit 21 to yr="2000 -Current" (291)

23 ((cost or costs or costing or intangible value$) adj3 illness$).ti,ab. (128)

24 23 not 21 (66)

25 limit 24 to yr="2000 -Current" (28)

The search results in set 22 and set 25 were assessed for relevance and relevant records were downloaded.

MEDLINE

1 (cost adj2 illness$).ti,ab. (741)

2 limit 1 to (english language and yr="2000 -Current") (453)

The search results in set 2 were assessed for relevance and relevant records were downloaded.

OAISTER

The search term “cost of illness” was used, with results limited to text documents. Records published since 1999 were considered.

REPEC

The search term “cost of illness” was used, and limited to publications from 2000 to 2009 and to publications coded as papers, chapters or books.

Search strategies for evidence on the benefits of alcohol use

The resources searched for this topic are listed in Table 2.

Table 2. Databases searched for benefits of alcohol use

Database	***Publisher***	***Coverage***	***Search date***
Cochrane Library	*Wiley*	*Issue 2009/3*	*1/10/9*
MEDLINE	*Ovid*	*1950 to Sept 29 2009 plus In process.*	*1/10/09*
TRIP	*http://www.tripdatabase.com/index.html*		*1/10/09*
NHS Evidence	*http://www.evidence.nhs.uk/default.aspx*		*1/10/09*

The search strategies are shown below.

Cochrane Library

The following search strategy was used

(alcohol near/6 (benefit or effect*)):ti,ab,kw 2250 records*

MEDLINE

1 (alcohol adj4 benefit).mp. [mp=title, original title, abstract, name of substance word, subject heading word] (137)

2 alcohol drinking/ (39642)

3 coronary disease/pc (12147)

4 cardiovascular diseases/pc (16356)

5 cholesterol, hdl/ (17759)

6 cerebrovascular disorders/pc (3334)

7 or/3-6 (47698)

8 risk factors/ (397079)

9 2 and 7 and 8 (454)

10 9 not 1 (447)

11 limit 10 to (abstracts and english language and "review articles") (54)

We explored results from set 1 and set 11

TRIP

The search strategy ‘alcohol benefit’ was entered into the search engine.

NHS Evidence

The following search terms were entered into the search engine.

alcohol AND (benefits or beneficial)

alcohol AND protective

Results

Results of searches for cost of illness methods

Hundreds of records were identified by the searches for cost of illness methods. The results were scanned for relevance and relevant records were downloaded. Downloaded records were loaded into Endnote and deduplicated. The numbers of records retrieved, downloaded and remaining after deduplication are shown in Table 3.

Table 3. Numbers of records retrieved, downloaded and remaining after deduplication.

Resource	**Records retrieved**	**Records downloaded**	**Records remaining after dedeuplication**
Databases			
Econlit	239	48	27
HMIC	319	37	34
MEDLINE	453	35	29
OAISTER	164	2	2
REPEC	170	4	4
Website searches		3	3

Results of searches for evidence on the benefits of alcohol use

The searches of systematic reviews identified 20 Cochrane reviews and 18 DARE abstracts but all were about reducing alcohol intake, and none of them reviewed the benefits of alcohol.

MEDLINE searches yielded 32 epidemiological reviews exploring the links between alcohol and preventive health.

TRIP yielded two overviews of the evidence on alcohol consumption and benefit and other reviews. NHS evidence yielded 6 records which included guidelines, overviews and academic reviews.

Produced by:
Public Health Information and Research Branch
Department of Health, Social Services and Public Safety
Castle Buildings, Stormont, Belfast BT4 3SQ

Telephone: (028) 9052 2520
Textphone: (028) 9052 7668

www.dhsspsni.gov.uk

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