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**ALCOHOL IN LONDON: A COST-BENEFIT ANALYSIS - A FINAL  
REPORT FOR THE GREATER LONDON AUTHORITY**

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## **EXECUTIVE SUMMARY**

Alcohol is an important part of London. It is a multi-billion pound industry that provides large benefits for consumers and many businesses and substantial revenues for the government. However, consumption of alcohol also leads to health and other social costs. In the past few decades considerable work has been done on evaluating the impact of these costs on the society but the evaluation of the social benefit of alcohol has largely been ignored. Moreover, none of these cost-benefit analyses specifically study London. This report seeks to bridge this gap and is part of an input into the Greater London Authority's (GLA) agenda for action on alcohol in London.

A look at the market for alcohol in London is a precursor to understanding the nature of the costs and benefits. There is a relative dearth of information related to the consumption of alcohol in London. This report accumulates data from various sources to understand the market as well as to form the basis of the cost-benefit analysis.

### **The Market for Alcohol**

Total expenditure on alcohol in London is estimated at £4.6 billion. London, like the rest of the country, is predominantly a beer-drinking city. More than half the consumption of alcohol in London is in the form of beer or cider. A quarter is consumed as wine and the rest as spirits. Frequency and consumption patterns differ markedly across gender, age and ethnic groups.

Men drink more frequently than women. They also consume more alcohol when they drink. On average, men consume 16.1 units of alcohol, while women consume 8.2 units per week in London. Similarly, consumption in young adults is higher than older people, for both men and women.

Most of the main minority ethnic groups in London, which form more than a quarter of the population, on average tend to consume less alcohol compared to the national average. Consumption also differs between various ethnic groups. Very few Pakistanis and Bangladeshis consume alcohol. Similarly Indian, Chinese and Black Caribbean population also drinks less when compared to the national average. However, the Irish consume far more than the average.

Data from the General Household Survey suggests that consumption patterns differs markedly across regions of the UK. A comparison of consumption of alcohol in 1998-99 amongst adults on the heaviest drinking day suggests that the proportion that drank over 4 units for men and 3 units for women (roughly the prescribed daily limit) was much lower for Londoners than for the rest of the country.

The average weekly consumption 'limit' of alcohol as prescribed by the Department of Health is 21 units for men and 14 units for women. A vast majority Londoners drink below

this limit. In fact, more than a fifth of men and a third of women do not drink, or drink less than a unit of alcohol a week. Many of the problems associated with alcohol are not related to people who drink in modest to low amounts. Alcohol is more likely to contribute to harm when drunk over prescribed weekly limits or in binges<sup>1</sup>. More than 24% of men and 15% of women drink over the prescribed safe limits of alcohol consumption.

## **Social Costs of Consumption**

On an individual level alcohol use may lead to psychological and physical harm. There can be knock on costs to the government, businesses or to society. In this report we identify three main costs associated with alcohol use: health costs (costs to the individuals and the NHS), costs of crime (including drunk driving), and workplace costs.

### *Health Costs*

This report assesses both direct costs (where alcohol is the sole cause of harm) as well as indirect health costs of alcohol. It examines the way that these costs are distributed between the NHS and the individual, although the two may be closely related (those who become seriously ill necessitate a cost to the NHS).

On an individual level there are two main effects of alcohol abuse – morbidity and mortality. Morbidity effects may range from lowered judgement from a few pints on a given day or a hangover, to long-term effects such as liver cirrhosis from consistent abuse of alcohol. There is little data available that could be used to cost morbidity resulting from alcohol use. However, data on the consumption pattern of Londoners suggests that a substantial proportion of population drinks above the prescribed safe limits. Hence, there will be morbidity costs.

It is estimated that alcohol contributed to 808 deaths directly, and 1,648 deaths indirectly in 1999. Valuing the cost of mortality has been the source of considerable discussion in the health literature. Despite the difficulties in valuing the loss of a human life, the UK government has made estimates based upon the willingness to pay approach.<sup>2</sup> The ‘human cost’ element of fatal injury is estimated at £750,640 in 2000. Using these estimates London-specific mortality costs related to alcohol equate to £0.61 billion (in 2000 prices) for direct deaths and £1.24 billion (in 2000 prices) for indirect deaths.

Alcohol abuse also results in additional costs for the NHS. These costs may arise at the primary or secondary care level. At the primary care level the costs consists of extra consultations with GPs and practice nurses, laboratory tests, pharmaceuticals and other

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<sup>1</sup> Modest levels of drinking may also contribute to harm because they impair certain abilities in people such as hand-eye coordination. This in certain instances could be lethal (for example accidents due to drunk driving).

<sup>2</sup> These estimates are published as guidance to public authorities on valuing road safety. However they are not specific to road accidents and are used in a range of other applications.

fringe costs relating to managing non-urgent symptoms and prescribing. Secondary level costs relate to more specialised treatment in hospitals and emergency care. These will include additional inpatient admissions and outpatient consultations due to alcohol abuse. Whilst sizable, in comparison to mortality these costs are small.

**Table 1**  
**A Summary of Treatment Costs for the NHS**  
**due to Alcohol Abuse in London (2000 prices)**

Item	Total activity	Total cost
<b>Primary care</b>		
GP and practice nurse consultations	302,438 GP consultations and 88,347 consultations	£2.7 million
Laboratory tests	105,275 haematology and biochemistry tests	£2.5 million
<b>Secondary care</b>		
Inpatient admissions	12,250 admissions	£15.6 million
Outpatient consultations	82,706 attendances	£8.4 million
A&E attendances	304,606 attendances	£20.5 million
Ambulance transportation	4,238 callouts	£2.0 million

*Source: NERA estimates.*

Table 1 shows the estimated additional activity generated due to alcohol use in London. Alcohol is estimated to contribute around 0.83% of all GP and practice nurse consultations. Similarly it also contributes to a substantial number of inpatient admissions, outpatient consultations and A&E attendances at the secondary care level. The additional costs of these treatment types as well as laboratory tests and ambulance callouts amount to over £52 million. It should be noted that the costs here only relate to treatment cost for the NHS and do not include the morbidity element to the individual. The table also does not include some important areas of costs such as pharmaceutical costs, due to lack of data. (For more detailed description of the estimates, refer to Section 3.1.3).

Under this heading also fall the costs to the social services of handling the consequences of alcohol abuse, but there is no data source to identify these costs.

### *Cost of Crime*

Besides health costs, the report evaluates the cost of crime that could be linked to alcohol use. This report looks at three main types of crimes: violent crimes; petty crimes such as robbery, burglary, theft and criminal damage; and road accidents where alcohol plays a part.

Measuring the cost of a crime is complicated as it needs to consider not only property loss or damage and personal injury, but also the emotional costs of the victim and wider social costs, such a loss of security. In case of injuries and deaths in road accidents relating to drunk driving, the estimates also need to evaluate the morbidity and mortality costs.

Estimates of the social cost of these crimes and activity levels are taken from literature. The cost of violent and small crimes is taken from a detailed study commissioned by the Home Office on the social and economic costs of crime. The costs of road accidents are taken from the Department for Transport.

Table 2 shows that the total cost of crime is over £1.7 billion. Of this the most substantial cost is related to drunk driving, primarily because road accidents, very often, result in severe casualties or death. Correspondingly, although similar in number, violent crimes result in more than three times the costs of other crimes, because they have a more profound effect on the victim.

**Table 2**  
**Cost of Crime Related to Alcohol**  
**Abuse in London (2000 prices)**

Item	Total activity	Total cost
Violent crimes	59,000 offences (excluding homicide)	£302 million
Other crimes such as robbery, burglary, theft and criminal damage	62,000 offences	£90 million
Accidents related to drunk driving	1,760 casualties from 1,151 accidents	£1,282 million

*Source: NERA estimates.*

### *Workplace Costs*

Lastly, this report evaluates the economic impact of the use of alcohol on employers. Even at moderate consumption levels, alcohol can act as a depressant - impairing reasoning, memory, perception and co-ordination. Alcohol can hence be a cost to the employers, for example through absence from work, reduction in working hours per day, or lower productivity while working. In an extreme case employers might also need to replace the employee.

The workplace cost of alcohol is usually studied under three heads - unemployment, loss of productivity and absenteeism. With the unemployment level in London being close to 7.3%, it is likely that a replacement would be available if an employee is discharged due to alcohol related problems. In this case, the cost to the employer would be the recruitment cost of replacement, for which there is little data available to make reasonable estimates. Similarly, there is no data available to estimate the 'productivity' effect of alcohol on employees.

There is a considerable literature on the impact of absenteeism on the economy. Using estimates from literature, we have estimated the cost of absenteeism to the businesses, based on relative absence levels of people with an alcohol problem compared to the average. It is estimated that alcohol abuse results in 1.68 million lost working days - amounting to a cost of over £294 million to London.

### *Other social costs*

Although the loss of an employee from the labour force may impose only limited costs on the previous employee, there is likely to be an ongoing social cost in support for the unemployed and perhaps unemployable individual. Much of this cost may be in social security payments, which are “transfer payments”, transferring money from taxpayers to the recipient, with a net social cost created only by the costs of administration and the distortions of taxation. However the loss of income from employment is a real social cost, to the individual or to his or her dependents. Abuse is also imposed on individuals and their households through hardships that are beyond those of the loss of income and conventional morbidity. However, no data available to estimate the total cost of these.

## **Social Benefit of Consumption**

### *Attribution of Alcohol Expenditure Across Stakeholders*

As a starting point, to estimate the social benefit of alcohol, this report looks in detail at how the £4.6 billion consumer expenditure on alcohol in 2000, is shared between different stakeholders in the market – namely the employees, the businesses and the government.

Employment due to alcohol is mainly generated in the manufacturing and in the distribution and retail of alcoholic drinks. Using the *Annual Business Inquiry (ABI)*, it is estimated that 5,500 jobs are linked to the manufacturing of alcohol that is consumed in London, and another 76,778 jobs (including part-time jobs) are linked to the retail of alcohol. After taking into account the taxes and national insurance paid by the employees on their gross salaries, it is estimated that the net benefit to the employees (including pension) ranges between £408 to £451 million in 2000. The net flow of taxes on income and national insurance to the government is estimated at between £159 to £175 million.

The main flow for the businesses is their net margin (profit net of taxes) on the sale of alcohol. There is little data available in the public domain on the cost of production and distribution costs of alcoholic drinks in London. However, again using ABI statistics, we have estimated the gross margin of the manufacturing, and distribution and retail companies as 15.7% and 15%, respectively. After taking into account the corporation tax on profits, it is estimated that manufacturers earned £399 million, and distributors and retailers earned £137 million in 2000 from alcohol sales in London. The total corporation tax amounts to £115 million.

The revenue from income taxes and national insurance contribution, as well as corporation tax is a very small share of the overall income that is generated for the government by the sale of alcohol. These taxes would also be expected if the resources were released from alcohol production and services to produce other goods and services instead. However, there are other *specific* taxes on the consumption of alcohol that generate substantial revenues for government, such as excise duty and VAT.

It is estimated that in addition to taxes on employees and businesses, the government receives around £1.6bn from various duties and taxes on alcohol in London, bringing the total share of government revenue in total expenditure to 41% (£1.9bn).

Table 3 summarises the financial flows arising out of the consumption of alcohol in London.

**Table 3**  
**Attribution of Alcohol Expenditure**  
**in London (2000 Prices)**

<b>Total expenditure on alcohol</b>	£4.62 billion
<b>Main beneficiaries:</b>	
Income for employees	£0.41-0.45 billion
Profits for businesses	£0.54 billion
Revenue for government (including taxes on employee incomes and corporate earnings)	£1.85-1.87 billion

*Source: NERA*

When interpreting this attribution, it is important to note that if the resources employed in producing alcohol-related products and services were not engaged in these activities they would be available to produce other goods and services instead. Thus wages and profits attributable to alcohol are not true measures of social benefit – in the absence of alcohol these expenditures would be generated through other economic activities, albeit with a difficult transition. To an economist, the real social benefit of alcohol lies in its consumption, and in its efficiency as a source of government revenue. However, figures on the production of alcohol related activities provide a measure of their importance today to the national and local economy, and of the transitional costs which would arise were it to markedly contract.

#### *Social Benefit of Alcohol – Consumer Surplus*

The primary benefit of alcohol lies in its utility to consumers. People consume alcohol because they value its consumption enough to pay the price for it. Hence, the net direct benefit of alcohol to consumers is the “consumer surplus” - the extent to which the value that consumers place on alcohol exceeds the price they pay.

Measuring consumer surplus is complicated. It requires estimating people’s willingness to pay for different quantities of alcohol (i.e. the demand curve), which is difficult to do in practice. We have made some indicative estimates of consumer surplus by assuming a linear demand curve and using point estimates of demand elasticity of different alcoholic drinks from literature. There is a degree of uncertainty around estimates of this type. Nonetheless, it looks to be a substantial benefit. Table 4 summarises the result.

**Table 4**  
**The Pleasure from Drinking Alcohol**  
**in London (£m)**

	<b>Beer</b>	<b>Cider</b>	<b>Wine</b>	<b>Spirits</b>	<b>Total</b>
Total spend on alcohol	2,257	197	1,228	935	<b>4,617</b>
Willingness to spend on alcohol	3,385	296	1,842	1,403	<b>6,926</b>
Estimated consumer surplus	1,128	99	614	468	<b>2,309</b>

*Source: NERA estimate.*

It is estimated that people are willing to pay up to 50% more than what they actually spend on alcohol. The total consumer surplus hence is close to £2.3 billion. From a policy perspective it is important to recognise from Table 4, that it is not what people actually pay, it is their willingness to pay that should be taken into account when evaluating the real benefit of consumption, as the two can vary substantially.

#### *Other Social Benefits*

Besides the direct benefits to consumers, alcohol in itself contributes to the consumption and viability of other industries for whom, it is almost a necessary complement. For many others its absence is likely to cause a substantial reduction in economic activity. While limitations in data prevent us from making any concrete estimates of the benefit of alcohol to these industries in material terms, this report looks at the impact of alcohol on wider economic activity, the late night economy and tourism as an indicator of how alcohol can affect economic activity, and affect the distribution of income and employment in London. (It is notable that these three areas are interlinked and hence there is an overlap in the benefits.)

The estimated turnover of hotels and restaurants in London is close to £6 billion. More than 1.7 million jobs are associated with these businesses. The late night economy is estimated to be linked to over 0.3 million jobs. Similarly tourist spend in London is over £8.9 billion and tourism supports some 7% of total employment in Great Britain. The economy of all these sectors is affected by the presence and use of alcohol in London. While alcohol solely may not generate much of this activity, it is seen as essential to sustain the level of turnover and employment in these sectors (although, again, if these other sectors contracted they would release resources which would be used to produce other goods and services).

A more substantial benefit, which may be much greater than the direct benefit to consumers, is the impact of alcohol related service on the quality of life. Local neighbourhoods, and the character of London as capital city, are clearly affected by the provision of these services, for which there is no evident substitute. However this is a benefit which appears to be inherently an issue for political judgment rather than explicit valuation.

## **Conclusions**

The purpose of this study is to inform the debate about the costs and benefits of alcohol in London. It has gathered a wide range of data to understand the market for alcohol in London and to evaluate the consequences of alcohol use and abuse.

The study shows that alcohol plays an important part in life in London. A vast majority of people consume it. The alcohol industry supports a substantial number of jobs and businesses, and also provides significant revenue to the government.

However, all this comes at a cost. The abuse of alcohol results in a number of deaths, morbidity cost to the individual, and substantial treatment costs for the NHS. There are also criminal justice and workplace costs.

Evaluating the effect of alcohol is not an exact science. We have illustrated at each step of the estimation our assumptions, which readers should look at to form their own judgements. Based on those assumptions, this report shows that in dealing with policy related to alcohol use, it is important to take a balanced look at the costs and benefits. It is important to keep in mind the value that people put on the consumption of alcohol, and its general contribution to the quality of life.

From the information available today it is not possible to value all the costs and benefits of alcohol, nor of the impacts of more or less tight regulation. Some of these omissions are substantial, in particular the contribution of alcohol to the quality of life of London residents and to London as capital city. However, these estimates do provide broad indicators of the economic and social effects of alcohol on London.

## 1. INTRODUCTION

This report evaluates the social costs and benefits of alcohol consumption in London. It studies the alcohol market in London and identifies the main costs and benefits – quantifying their impact where possible.

The Greater London Authority (GLA) commissioned NERA to undertake this study as an input to a consultation document “Agenda for action on alcohol in London” that is to be published in early 2003. While a wide variety of literature and data is available on the effects of alcohol consumption and trade worldwide and for the UK, there is little research that focuses specifically on London. Hence, the purpose of this report is to focus on costs and benefits of alcohol to London. It is worth noticing that much of the literature focuses on social costs of alcohol. To provide a balance we have gone into some detail to explore potential benefits.

The consumption of alcohol affects physical and psychological well-being of individuals. Yet many individuals, who are perhaps aware of its negative affects, still consume it.<sup>3</sup> Recent studies have shown that alcohol dependent workers may affect productivity.<sup>4</sup> On the other hand the consumption of alcohol supports an industry and its employees. The government also earns a large portion of its revenues directly from the alcohol industry. It also brings substantial benefits to consumers, who (apart from the small minority who are addicted) would not otherwise buy the product. Much research has compared the numbers for these various costs and benefits, including government outlays to treat ill health or protect people from crime that may be attributable to alcohol consumption.

This report looks at three main stakeholders in the market of alcohol - the general public, businesses, and the government. The framework under which this study analyses the cost of alcohol consumption has to balance the impact of alcohol on each party. To the extent that is making judgments about the distribution of costs and benefits between different groups, this exercise is fairly subjective.

The analytical literature on the social cost of alcohol consumption can be divided into four important perspectives: public health, public finance, public choice and welfare economics. Each has its distinctive perspective. While public health is an important issue, it is clearly only one of many. The same is true of public finance. Public choice theory takes an overview, but from a perspective of rival stakeholder influences on policy. Welfare economics takes a more formal, quantitative overview, which can subsume public health and public finance analysis, by explicitly identifying all the social costs and benefits and

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<sup>3</sup> According to Lader and Meltzer (2001), 71% of people in the UK who drink alcohol over the prescribed limits, know about the prescribed limit of consumption.

<sup>4</sup> Discussed in Section 3.3.

where they fall. It is the approach that we see as the most useful analytical basis for this study.

The welfare economics approach allows evaluation of each cost and benefit separately; hence it can be used to inform the policy makers and the stakeholders about the comparative costs and benefits. A basic limitation of this perspective is the difficulties in measurement and valuation of issues that are very complicated to assess, such as pleasure from drinking. Estimates in these cases are at best a qualified approximation. Where measurement is possible, data availability is often limited. This is particularly true in the case of London, as regional data for London is often not detailed. Where data limitation does not allow quantification, we qualitatively assess the extent of costs and benefits by looking at previous research or data from other regions.

The social costs of alcohol are sometimes divided into internal and external costs and benefits. Internal costs and benefits are obvious and seen by consumers in their decision to consume alcohol. External costs and benefits in contrast are not considered in decision making by individuals either because they fall on others, or because consumers lack information about them – for example the cost of unemployment caused due to excessive drinking.

The report first studies the market for alcohol in Section 2. This forms the basis of our estimation of costs in Section 3, and benefits in Section 4. The final section presents a summary of our estimates and some important conclusions.

## 2. THE MARKET FOR ALCOHOL

The section provides a snapshot of the main attributes of the market for alcohol in London. The market for alcohol is far broader than just the use of alcohol in beverages. However this section only presents the level of expenditure and consumption of alcohol in London. The broader implications of alcohol consumptions are discussed in Sections 3 and 4.

### 2.1. London in Brief

London had in 2000 a population of over 7.3 million people (12% of the total UK population). It is one the most important financial centres of the world – and shares the common traits with other populous central cities of the world of higher income, prices and crime rates. Table 2.1 presents some key statistics on London.

**Table 2.1**  
**Key Statistics on London**

	Unit	London	UK
GDP per head, 1999	£	18,979	12,972
Average weekly household income, 1998-01	£	615	480
Average weekly household expenditure, 1998-01	£	436	366
Average dwelling price, 2001	£	201,913	122,005
Recorded crime per 100,000 population, 2000-01		13,761	9,814
Population, 2000	M	7.375	59.756
Proportion under 16	%	20.2	20.2
Proportion of pension age and above	%	14.3	18.1
Others (working age)	%	65.5	62.7
Ethnic minority population – of which	M	2.089	4.541
Mixed	%	8.7	11.7
Black or Black British	%	38.4	27.5
Asian or Asian British	%	41.7	50.3
Chinese	%	7.9	6.4

Source: ONS (2002).

While Londoners earn as well as spend much more than the average UK national, it is notable that living costs are much higher in London. Also, the population demographics are slightly different from national levels. The proportion of working age population is slightly higher in London – a segment of the population likely to drink more than others. Like other large cities in the world, London is also known for the high proportion of ethnic minorities. Over 2 million people from various minority ethnic groups work in London – over 28% of the city's population and more than 46% of the overall UK ethnic minority population.

In the calculation of costs and benefits it is important to remember the differences between London and the rest of the UK. Calculations for London need to take into account the population and income traits of Londoners.

## 2.2. Main Aspects of the Market

Alcohol is consumed in the form of wines, beers and spirits. These beverages differ primarily in their method of production. The alcohol used in these beverages is ethanol, which varies in its extent in these drinks (see Table 2.2).

**Table 2.2**  
**Typical Alcohol Volume, by Type of Drink**

	Percent
Beers	2-8
Unfortified wines	8-14
Fortified wines	20
Spirits	40-50

*Source: Cook and Moore (1999).*

The individual consumption, price, taxation and other attributes of each of these beverages differ between genders, age groups and areas. The UK as a whole is predominantly a beer-drinking society with more than half of all alcohol consumed in beer form in 2000, compared to a quarter of the consumption in wine form and the rest in spirits and alcopops.<sup>5,6</sup>

### 2.2.1. Expenditure

Based on the *Family Expenditure Survey* (FES) the Office of National Statistics (ONS) estimates that average household expenditure in London on alcoholic drinks is £16.40 per week, or 3.76% of their total expenditure. This is slightly less than the 4.05% average for the UK.

Total expenditure on alcohol in London implied by the FES statistics is £2.7bn in 2000. This is 14% of the total expenditure on alcohol in the UK (£19.6bn). However, the approach used by the FES seems to underestimate both expenditure on alcohol as well as overall expenditure by households. According to *Consumer Trends* (CT), based on the figures released by the Customs and Excise, in 2000 total spend on the purchase of alcohol in the UK is close to £33.6bn – which is 5.70% of overall consumer expenditure (£589.2bn).<sup>7</sup> This implies that the FES data under-reports alcohol consumption by 41% at the national level.

<sup>5</sup> The term ‘alcopops’ is used to describe flavoured alcoholic drinks and pre-mixed spirits. It may also contain some ciders.

<sup>6</sup> Beer & Pub Association (2001).

<sup>7</sup> ONS (2001a).

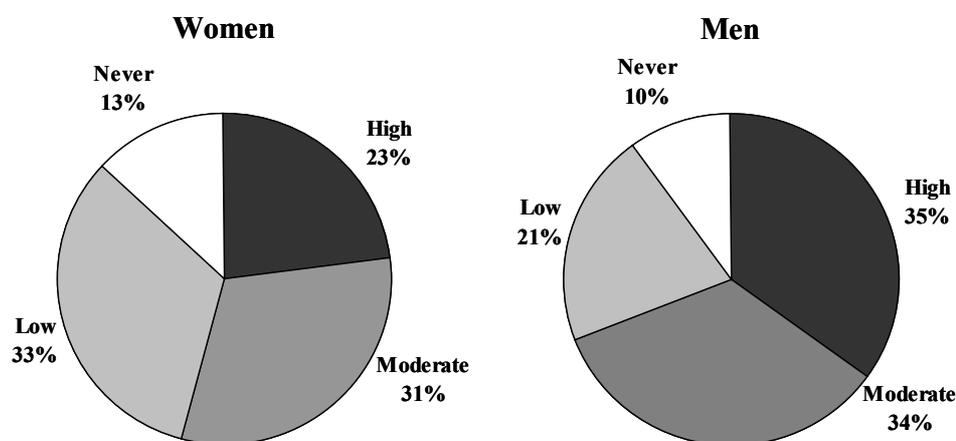
Under-reporting in the FES data is probably because it looks at household expenditure on alcohol and hence may exclude expenditure by businesses. Also, it is possible that in a survey people may not provide an accurate assessment of their consumption. Assuming, a similar level of under-reporting for London as for the UK, implies £28.8 per week expense by the households (£ 4.62bn in total). (A more detailed description of this expenditure on the basis of different drink types is presented in Table 2.7).

### 2.2.2. Frequency of drinking

Detailed figures on the frequency and volume of alcohol consumption are not available for London. However the ONS surveys provide good information on the consumption patterns of individuals in the UK. We have used the data from these surveys and adapted it to London.

Men drink more frequently than women. More than a third of all men report drinking 3 to 4 days in a week, compared with 23% of women. A third of these 'high frequency' people drink almost daily.

**Figure 2.1**  
**Comparison of Drinking Frequency Between Men and Women in the UK**



Source: Lader and Meltzer (2001).

Note: High = More than 3-4 days a week; Moderate = Once or twice a week; and Low = between once or twice a year to once or twice a month.

Figure 2.1 shows that a third of women drink once or twice a week and nearly a half drink less frequently or not at all. In contrast, while a third of the men drink once or twice a week, less than a third drink less frequently or not at all.

This frequency does vary between different age groups. Table 2.3 shows that for men the distribution of different levels of drinking is roughly the same for the under 65 age groups. The notable deviancies are the over 65s, amongst whom the proportion who drink

moderately is much lower than the other age groups. Also notable is the small proportion of abstainers and low frequency drinkers in the 25-44 age groups.

For women the pattern of consumption between the 16-24 and 25-44 groups is fairly similar. Compared to the overall average, their proportion of moderate drinkers is almost 20% higher than for the over 65s. The 45-64 age groups have more high frequency drinkers but the 65 and over age groups have many more low frequency drinkers and non-drinkers. With age the combination of moderate and high frequency drinkers goes down, and that of low frequency and non-drinkers goes up. This is also reflected in the very high proportion of over 65s that do not drink at all.

**Table 2.3**  
**Frequency of Drinking, by Age and Gender (Percentage of Total)**

Age	Men				Women			
	16-24	25-44	45-64	65+	16-24	25-44	45-64	65+
High	30	36	34	38	22	21	26	20
Moderate	38	38	35	23	38	36	31	17
Low	22	18	23	26	30	32	33	37
Never	11	8	9	13	11	10	11	26

Source: Lader and Meltzer (2001).

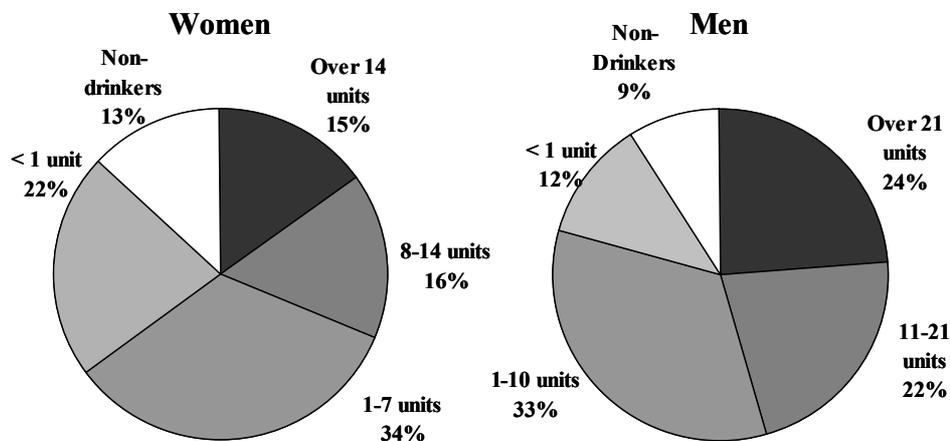
Note: High = More than 3-4 days a week; Moderate = Once or twice a week; and Low = between once or twice a year to once or twice a month.

### 2.2.3. Volume of drinking

Alcohol can become a significant health problem if it is consumed in excess. According to the Department of Health, drinking 21 units a week for men and 14 units a week for women is unlikely to cause serious harm to the individual.<sup>8</sup> However, 24% of men and 15% of women, on average, pass this limit.

<sup>8</sup> A unit of alcohol is defined as 8 grams by weight or 1cl (10ml) by volume of pure alcohol. This approximately is the amount of alcohol in half a pint of ordinary strength beer, a single pub measure of spirits (25ml), or a small glass of ordinary wine.

**Figure 2.2**  
**Comparison of Alcohol Consumption Between Men and Women (UK)**



Source: Lader and Meltzer (2001).

Figure 2.2 shows that not only women are less frequent drinkers, but the proportion of women that drink over the prescribed limit is also less than men. Also notable is the fact that of the people who drink, a fair proportion of both men and women drink less than a unit per week. Moreover, four-fifths of women and three-fourths of men in the UK drink below the prescribed limit of alcohol consumption. It is important to note that many of the problems caused by alcohol that this report intends to cost are not related to these moderate and low-end consumers. Most of the costs are related to a small proportion of high-end consumers and 'binge' drinkers.

The consumption pattern differs markedly between different regions in the UK. Data from the General Household Survey suggests that Londoners drink less compared to the rest of the country. A comparison of the consumption in 1998-99 amongst adults on the heaviest drinking day suggests that the proportion that drank over 4 units for men and 3 units for women (roughly the prescribed daily limit) was much lower for Londoners than for the rest of the country.

**Table 2.4**  
**Alcohol Consumption on the Heaviest Drinking Day Last Week,**  
**People Aged 16 and Over, 2000-01, in London and the UK (Percentage of Total**  
**Population)**

	Nothing	Up to 4 units for men/ 3 units for women	Between 4 to 8 units for men/ 3 to 6 units for women	More than 8 units for men and 6 units for women
<b>Men</b>				
London	32	37	14	17
UK	26	36	17	22
<i>Average consumption (units/day)</i>	0	2	6	12
<b>Women</b>				
London	46	35	12	7
UK	41	36	13	10
<i>Average consumption (units/day)</i>	0	1.5	4.5	9
<b>Using Average consumption weights, the estimated average consumption of alcohol on the heaviest drinking day last week</b>				
		<b>Men</b>	<b>Women</b>	
London		3.62	1.70	
UK		4.38	2.03	
<i>London compared to the UK (UK =100)</i>		83	84	

*Source: NERA estimate based on data from General Household Survey - ONS (2001b).*

Table 2.4 shows that the proportion of adults who did not drink in the last week is substantially higher in London. By assuming an average consumption rate across these four categories, the table shows that, on the heaviest drinking day, men drink 17% less and women 16% in London compared to the average of men and women in the UK.

In terms of variation across age groups, while the frequency of drinking does not differ dramatically in the early age groups, their volume of consumption does. The volume of consumption is driven by a variety of factors but generally younger age groups are expected to drink far more than the older ones. Table 2.5 shows that, for both men and women, the proportion consuming more than the prescribed limit goes down dramatically as the age increases. For men the proportion of high-end consumers in the 16-24 age group is more than twice the proportion in the over 65 age groups. For women this difference is almost 8 times.

**Table 2.5**  
**Estimated Average Weekly Consumption of Alcohol by Age and Gender**  
**for London, 2000 (Alcohol Units)<sup>9</sup>**

	Male					Female				
	16-24	25-44	45-64	65+	Total	16-24	25-44	45-64	65+	Total
Non-drinkers	11	8	9	12	<b>9</b>	11	10	11	26	<b>13</b>
Under 1 unit	10	8	13	17	<b>11</b>	11	19	25	33	<b>22</b>
Low	24	33	35	38	<b>33</b>	29	35	36	27	<b>33</b>
Moderate	21	24	22	17	<b>22</b>	18	18	17	9	<b>16</b>
High	35	27	21	15	<b>25</b>	31	17	11	4	<b>15</b>
Average Consumption	22.4	16.4	14.1	11.5	<b>16.1</b>	14.8	8.3	7.4	3.4	<b>8.2</b>

*Source: Laden and Meltzer (2001), ONS (2002), NERA estimate.*

*High = Over 21 units for men and 15 units for women; Moderate = Between 11-21 units for men and 8-14 units for women; Low = 1 to 10 units for men and 7 units for women.*

Besides adult consumption, alcohol use among young people (aged 11-15) has become substantial. According to a survey carried out by the Department of Health<sup>10</sup> consumption of alcohol in children under 16 has doubled between 1990 and 2000. In 2000, the average consumption for boys was 11.6 units and for girls 9.1 units. However it is important to note that the proportion drunk by 15 year olds is much higher than 11 year olds.

<sup>9</sup> London figures are estimated by taking the UK population's consumption figures by gender and age and adapting them to London by taking into account London's population's age and gender profile. However, for each gender and age group, average consumption may differ for a Londoner compared to a UK national (for example, the 16-24 male group in London may consume less than what the 16-24 male group in the UK consumes). Indeed as Table 2.4 shows that on the heaviest drinking day, on average Londoners consume 16-17% less alcohol. However, this is not taken into account in Table 2.5 as the relevant information is not available for a typical consumption day.

<sup>10</sup> Boreham and Shaw (2000).

**Table 2.6**  
**Estimated Consumption of 100% Pure Alcohol, London and the UK, 2000**

	Consumers	Average weekly consumption	Yearly consumption	Yearly Consumption
	Million	Units	Million Units	Million Litres
<b>London total population</b>	<b>6,334</b>	<b>12.00</b>	<b>3,953</b>	<b>40</b>
Men over 16	2,919	16.14	2,450	24
Women over 16	2,966	8.17	1,260	13
Men 11-15 year old	230	11.6	139	1
Women 11-15 year old	219	9.1	104	1
<b>UK total population</b>	<b>51,522</b>	<b>11.52</b>	<b>30,856</b>	<b>309</b>
Men over 16	23,267	15.5	18,753	188
Women over 16	24,412	7.9	10,029	100
Men 11-15 year old	1,971	11.6	1,189	12
Women 11-15 year old	1,872	9.1	886	9

Source: NERA estimate using Lader and Meltzer (2001).

The ONS survey data suggests that overall consumption of alcohol in London is estimated to be around 40 million litres per year compared to 309 million litres purchased in the UK. As in the case of expenditure on alcohol, the implied consumption figures from the ONS survey seem to underestimate the consumption in the UK. They may not include non-household consumption such as consumption in the corporate sector. ONS (2001a) also points out that the high volume consumers are thought to under-report their consumption in these surveys. According to estimates of Customs and Excise<sup>11</sup> the estimated consumption of pure alcohol in the UK is around 496 million litres. This implies that Lader and Meltzer (2001) underestimates consumption by 38%. A similar level of underestimation would imply a consumption volume of 63.5 million litres in London. We use this figure in our analysis in the following sections of this report.

#### 2.2.4. Types of drinks

Data on the split of alcohol consumption across different beverage types is not available for London. However, the Beer and Pub Association in their annual statistical handout, present detailed statistics on the consumption of alcohol as well as expenditure on different beverage forms. Table 2.7 uses that data to estimate consumption and expenditure across drink types for London.

<sup>11</sup> Beer and Pub Association (2001).

**Table 2.7**  
**Volume and Expenditure of Alcohol Consumed (London Estimates), by Drink Type**

	<b>Beer</b>	<b>Cider</b>	<b>Wine</b>	<b>Spirits (pure alcohol)</b>	<b>Total</b>
Vol. of alcohol (Litres m)	30.62 48.2%	3.94 6.2%	17.03 26.8%	11.94 18.8%	63.53 100%
<i>Total volume (Litres m)</i>	730.25	77.31	165.34	11.94	
Expenditure (£bn)	2.26 48.9%	0.20 4.3%	1.23 26.6%	0.94 20.3%	4.62
Implied expenditure per drink, £	1.76 per pint	1.45 per pint	1.30 per 175ml	1.91 per measure	

*Source: NERA estimate using Beer and Pub Association (2001).*

Table 2.7 shows that more than half of all alcohol is consumed in beer and cider form. A quarter is consumed in wines and the rest in spirits. In terms of expenditure per unit of alcohol consumed, cider is less expensive than the other drink types. Spirits are relatively more expensive. As a result, in terms of value the share of spirits is slightly higher, and for cider it is lower, compared to the shares by volume<sup>12</sup>.

<sup>12</sup> The implied expenditure per unit of different drink types might seem low when compared to average prices in a bar or restaurant in London. This is because the estimate is based on total consumption. Hence, it would also include consumption, for example, at home, which is usually cheaper than consumption in a bar or restaurant.

## 2.2.5. Consumption by minority ethnic group

**Table 2.8**  
**Consumption in the Last Week on the Heaviest Drinking Day, by Ethnic Minority Groups (Percentage of Total)**

Age	Black C'bbean	Indian	Pakistani	B'deshi	Chinese	Irish	National
<b>Men</b>							
More than 8 units	10	10	1	2	2	35	25
Between 4 and 8 units	17	12	2	0	6	23	20
Up to 4 units	35	22	2	1	29	21	31
Never	38	56	95	98	63	21	23
<b>Women</b>							
More than 6 units	6	2	1	0	3	14	12
Between 3 and 6units	12	3	0	0	6	23	17
Up to 3 units	32	9	1	0	20	28	33
Never	51	85	98	100	72	35	38

Source: ONS (2001a).

Detailed figures on the volume and frequency of consumption, and expenditure on alcohol are not available for different minority ethnic groups. However, the Health Survey for England asks men and women of different ethnic backgrounds whether they had consumed alcohol in the last week. The result show that, other than the Irish, both men and women in minority ethnic groups were less likely to have drunk in the last week. For Pakistanis and Bangladeshis, an overwhelming majority is likely not to have drunk at all in the last week.

Both Irish men and women are likely to have drunk more than the national average. They are also likely to drink more on their heaviest drinking day.

## 2.2.6. Prices and affordability

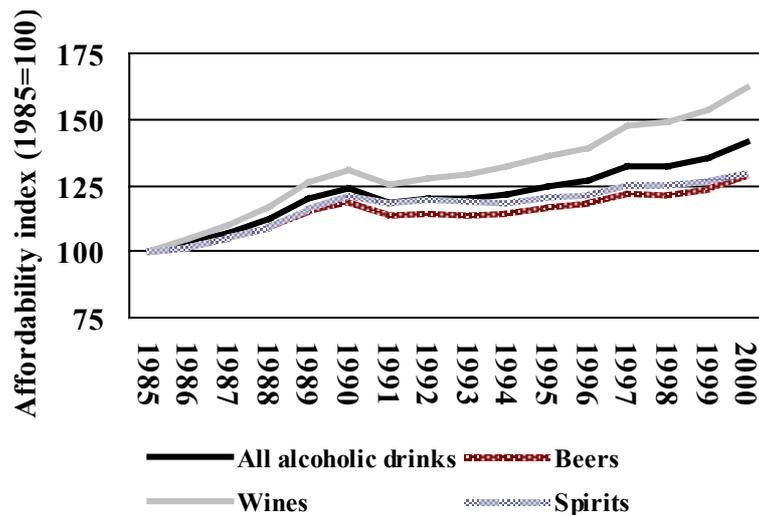
The prices of alcoholic drinks have been rising steadily, relative to inflation, for many years. Between 1985 and 2000, the prices of all alcoholic drinks have increased by up to an additional 20% over the increase in retail prices.<sup>13</sup> However, during the same period real incomes have risen by over 57%, resulting in alcohol being more affordable to the consumers – to the tune of 40% for certain drink types (for data on income and price change see Table A.1). Within alcoholic drinks, the major increase in prices is seen in beers and spirits.

Figure 2.3 shows the trend in the affordability of beverages that contain alcohol. Affordability is defined as the difference between rise in income compared to the rise in

<sup>13</sup> Based on retail price index including all items.

prices. It shows that between 1985 and 2000, the affordability of alcoholic drinks increased consistently apart from 1990-91, where prices rose much faster than real incomes. Between 1985-2000, the affordability of wines has increased by over 60%, compared to beers and wines whose affordability increase by less than 30%.

**Figure 2.3**  
**Affordability of Alcoholic Drinks, UK (1985=100)**



Source: NERA estimate.

This market analysis suggests that alcohol is a major part of life for people of all ages in London. About 20 percent of people drink to levels which exceed the governments recommended limits, the proportion drinking to the point at which they may cause substantial harm to themselves and to the society appears to be much smaller. The evidence suggests that average consumption in London is lower than the rest of the UK. Other aspects of the market of alcohol in London in terms of their social costs and benefits are discussed in Sections 3 and 5 respectively.

### **3. EVALUATION OF COSTS**

The costs of excessive alcohol consumption accrue to the individual and to society. On an individual level, even moderate levels of alcohol consumption may lead to physical and psychological harm. This effect on personal health may affect not just the individual himself but also government and businesses. The following sections illustrate this by analysing the social costs of alcohol including: health costs (costs to the individuals and the NHS), costs of crime (including drunk driving), and workplace costs.

#### **3.1. Health Costs**

It is important to distinguish between ill health of the individual who is consuming alcohol and those who suffer ill health or injury as a result of another's alcohol consumption (such as a road accident arising from drunk driving).

Thus the types and costs of ill health that are related to alcohol are divided into two levels: costs at an individual level, and at the level of the NHS. Although these costs are related (those who become seriously ill necessitate a cost to the NHS), this report examines the way that these costs are distributed between the NHS and the individual.

The report goes further than just looking at costs that arise in instances where alcohol is the sole cause of harm (for example death due to binge drinking) – often termed as direct costs of alcohol. This report also evaluates instances where alcohol indirectly causes significant harm by aggravating harm caused by other sources.

Costs incurred in the health system as a result of criminal activity (e.g. drunk driving) are considered in a later section on the costs of alcohol-related crime.

##### **3.1.1. Ill health due to alcohol consumption**

Individuals face health risks from alcohol in two instances: the first where there is a high level of alcohol consumed in a rapid space of time (so called binge drinking), second where there is a high level of alcohol consumed and sustained over the longer term (leading to addiction and long term health risks).

The acute effects of alcohol can be described according to the level of alcohol in the blood. Table 3.1 sets out the main effects from a low level of blood alcohol through to the effects of excessive drinking.

**Table 3.1**  
**Acute Effects of Alcohol**

<b>Blood alcohol level (mg/100ml)</b>	<b>Estimated no. of consecutively drunk pints of beer per average man</b>	<b>Effects</b>
20	Less than a pint	Warmth and relaxation
40	1+	Mood and behaviour begin to alter, driving ability impaired
50	< 2	Less control over behaviour and lowered judgement
80	2+	Legal upper limit for driving a motor vehicle
100	3+	Unsteadiness, impaired speech and emotional judgement
150	5	Muscle inco-ordination, double vision, sluggish reactions
200	< 7	Nausea, depression, irritability
300	10	Gross intoxication, loss of sight/hearing, confusion
400	13+	Progressive stupor, "passing out"
500-800	16+	Coma, paralysis of respiratory centre, fatal outcome

Source: *Catalyst (2001) and Powell (1990)*.

Binge drinking may lead to levels of blood alcohol exceeding 400 mg/100ml and have a possibly fatal impact. Drinking at these levels will typically lead to costs for the NHS as well, particularly in terms of accessing emergency care.

The long-term effects of alcohol misuse can include liver disorders, gastrointestinal problems, nerve and muscle damage, circulatory problems, reproductive problems, malnutrition, respiratory problems and mental health. Specific examples include pancreatitis, stroke and cancer of the oesophagus.<sup>14</sup>

### **3.1.2. Costs to the individual**

An individual will bear a variety of health costs as a result of consumption of alcohol. The affect of alcohol on health may be temporary or permanent, and may also vary in severity. Table 3.2 provides an overview of the ill health experienced as a result of alcohol consumption, both direct and indirect.

<sup>14</sup> Catalyst (2001).

**Table 3.2**  
**Nature of Health Costs at the Individual Level**

	<b>Temporary effects</b>	<b>Permanent effects</b>	<b>Severe effects</b>
Direct	Effect of temporary ill health after drinking e.g. headache, nausea and fatigue	Effect of permanent ill health after high levels of consumption over a period of time e.g. liver cirrhosis	Mortality as a result of binge drinking
Indirect	Effect of temporary ill health as a result of personal injury after drinking e.g. falling over	Effect of accidents as a result of drinking.	Mortality as a result of accidents after drinking

Source: NERA.

### 3.1.2.1. *Temporary effects*

Comparatively low levels of alcohol use often results in short-term health effects such as fatigue, nausea, headache and loss of coordination. This may further lead to indirect costs such as minor injuries. While, these health effects might not result in any material costs, they do affect an individual's quality of life – often termed as morbidity.

Data on the temporary effects of alcohol is difficult to find – not least due to the variety of types of effects involved. However, the previous section shows that 17% of men drink over 8 units (equivalent to 4 pints of beer) on their heaviest drinking day and 7% of women drink over 6 units (equivalent to 3 pints of beer) (see Table 2.4). At these levels individuals face muscle in-coordination and are susceptible to morbidity. Hence, although not quantifiable it is clear that a large proportion of London's population faces these costs.

Alcohol is released from the bloodstream at 10 mg (or one unit) per hour.<sup>15</sup> Therefore, these temporary affects may affect the individual for a considerable amount of time, affecting his or her productivity. A possible cost arising from this is the affect on workplace productivity. These costs are estimated in Section 3.3.

### 3.1.2.2. *Permanent effects*

Permanent costs of alcohol use range from greater difficulty in performing everyday tasks to more serious health impacts, such as cancer. Indirect permanent costs may take the form of much higher use of A&E facilities in hospitals to loss of life from accidents. Potentially these costs could be substantial. Estimates suggest that there are more than 0.2 million problem alcohol users in London in the age range 15 to 64.<sup>16</sup> These form the pool of people that are at

<sup>15</sup> Powell (1990).

<sup>16</sup> London Health Observatory, Alcohol Misuse <http://www.lho.org.uk/hil/alcohol.htm>.

risk from these permanent effects. However, as with temporary effects, the morbidity related to permanent affects is not easily quantifiable.

There also external costs related to permanent effects of alcohol – for example, loss of output (see Section 3.3) and additional A & E costs.

### 3.1.2.3. *Severe effects - Mortality*

Excessive alcohol consumption, or actions under the influence of alcohol may lead to death. Of the total number of deaths in London (64,583 in 1999), it is estimated that the annual average number of deaths due to alcohol is 808 (estimated using 1998 –2000 data).<sup>17</sup> This suggests that the London specific direct mortality as a result of alcohol is 1.25 per cent. This is in line with national data. Published mortality figures by cause of death for England and Wales<sup>18</sup> suggest 5,508 deaths related to alcohol use in 1999 (see Table A.2) out of total number of deaths of 556,100 in 1999<sup>19</sup> - implying 1% of deaths to be related to alcohol.

Alcohol may also contribute to mortality indirectly, as it can increase the prevalence of particular diseases. Work undertaken by Godfrey and Hardman (1994) made use of attributable fractions of alcohol in overall mortality derived from clinical studies to provide an estimate of indirect mortality due to alcohol. Table A.3 reproduces these attribution fractions for specific diseases for males and females. We have used these attribution fractions and data on London specific mortality provided by the LHO to determine the level of indirect mortality in London due to alcohol. The figures imply that that on top of the 808 deaths directly related to alcohol there are a further 1,648 deaths indirectly related to alcohol in 1999.

Valuing the cost of mortality has been the source of considerable discussion in the health literature. Despite the difficulties in valuing the loss of a human life, the UK government has taken information based upon the willingness to pay approach.<sup>20</sup> The ‘human’ costs element (capturing morbidity) ranges from £7,640 for a slight injury, to £104,300 for a serious injury and £750,640 for a fatal injury (all figures for 2000).<sup>21</sup>

Applying the fatal human cost element to the number of deaths in London directly attributable to alcohol would imply a figure of £0.61 billion (in 2000 prices). Applying the fatal human cost to indirect mortality due to alcohol gives a figure of £1.24 billion (in 2000 prices).

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<sup>17</sup> London Health Observatory analysis of ONS data.

<sup>18</sup> ONS (2001a).

<sup>19</sup> ONS (1999a).

<sup>20</sup> Department for Transport (2000).

<sup>21</sup> These figures are used in government mainly but not only for the analysis of transport safety. We use them to estimate the overall human costs of alcohol-related death in the absence of any more specific data.

### 3.1.3. Costs to the NHS

The NHS provides health care service to all individuals within the UK. The type of services provided include:

- **Primary care:** This consists of General Practitioners (GPs) who provide a range of family health services. GPs may be involved in dealing with alcohol-related health problems when these are not urgent. This may include managing of symptoms and prescribing. GPs are also involved in preventative care.
- **Secondary care:** This consists of specialists in the hospital setting who provide inpatient and outpatient care. Secondary care also encompasses the provision of emergency care – i.e. for those who bypass primary care and attend Accident and Emergency departments.

In addition, Local Authorities will incur some alcohol-related costs (e.g. costs of residential rehabilitation and day-care programmes). In the time available, we have not been able to identify alcohol- and London-specific costs, but we recognise that this will be an addition to health-related costs.

We discuss the cost to each in turn.

#### 3.1.3.1. *Primary care costs*

Alcohol misuse may result in extra activity in the primary care sector. The main areas of expense in the primary care sector include

- GP and practice nurse consultations
- Laboratory tests (e.g. liver function tests, and tests for the level of blood alcohol)
- Others (such as community psychiatric team contacts and pharmaceuticals)

#### *GP and practice nurse consultations*

Estimates of primary care activity related to alcohol consumption and the extent of their cost to London are not available. However, we have made some estimates on the relative extent of primary care activity that could be attributed to alcohol consumption.

For GP and practice nurses consultations we have used the annual average consultations per person from the General Household Survey (ONS (2001b)) by gender and age group. We have adapted this data to London by taking into account the gender and age profile of London's population. The estimate for London implies 36.5 million GP consultations and 10.7 million practice nurse consultations in London in 2000.

We have estimated the proportion of consultations related to alcohol from literature.<sup>22</sup> It is estimated that 0.83% of all GP consultations are related to alcohol use (of which almost 34% are directly attributable to alcohol use). We apply the same ratio to consultations with practice nurses as well. The results show that in 2000, 302,438 GP consultations and 88,347 consultations with practice nurses related to alcohol misuse (London estimate).

Estimates of the average costs of GP and practice nurse consultations are not available for London. However we have data on the numbers of GPs and practice nurses<sup>23</sup>, and their average salaries,<sup>24</sup> for England. We inflate the salaries to take into account employment costs on top of basic salaries (i.e. national insurance contributions and pension costs).<sup>25</sup> This implies that GP and practice nurse staff costs for England are close to £2.2 bn. Assuming a similar per capita expense for London, implies a staff cost of £323 million for London. Since only 0.83% of the total consultations by GPs and practice nurses are related to alcohol, the total staff cost that relate to alcohol are estimated to be £ 2.7 million for London (assuming similar for alcohol and non alcohol-related consultations).

### *Laboratory tests*

Evidence from a Scottish study on alcohol, suggests that alcohol-related consultations require undertaking some laboratory tests such as testing for blood alcohol levels.<sup>26</sup> It is assumed that for each GP consultation that is directly attributable to alcohol use, there is at least one haematology and biochemistry test. This would imply 105,275 haematology, and a similar number of biochemistry tests related to alcohol use in London. The study also suggests an average cost of £10 for a haematology test and £14 for a biochemistry test. Using the same costs for London would imply a cost of £2.53 million for laboratory tests related to alcohol misuse.

#### *3.1.3.2. Secondary care costs*

Secondary care is structured somewhat differently to primary care. The main areas of concern at secondary care level relating to alcohol misuse include: inpatient admissions, A&E attendances, outpatient attendances and ambulance costs.

### *Inpatient admissions*

Individuals can require inpatient care for a range of direct alcohol-related ill health. The LHO have provided us with detailed breakdown of inpatient admissions for London by ICD 10 code where the primary and secondary diagnoses relate to alcohol. This data is presented

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<sup>22</sup> Catalyst (2001).

<sup>23</sup> Department of health website: [www.doh.gov.uk](http://www.doh.gov.uk).

<sup>24</sup> Department of Health (2001).

<sup>25</sup> Inflate the salaries by 35% assuming 15% national insurance contribution and 20% income tax contribution.

<sup>26</sup> Catalyst (2001).

in Table A.9 in the appendix. It suggests that in 2000/01, an estimated 12,250 inpatient admissions in London were attributable to alcohol. In 1999, the average acute spend per inpatient admission for the NHS was close to £ 1,239.<sup>27</sup> Using these volume and cost (inflated by 3% to take inflation into account)<sup>28</sup> figures as an estimate for London, implies total costs of £15.63million for direct alcohol-related inpatient admissions in London in 2000. (Note, however, that this is based on the assumption that alcohol-related admissions reflect average inpatient costs).

### *A&E attendances*

There were almost 2.54 million A&E attendances in London in 1998/9, made up of 2.37 million first attendances and 0.17 million follow-up attendances.<sup>29</sup>

There is no data on the number of A&E attendances that are attributable to alcohol so we have used an estimate derived from the literature. A study of Scotland<sup>30</sup> estimates that 12% of the total A&E attendances are related to alcohol. Using this estimate implies 304,606 A&E attendances in London to be related to alcohol in 1999.

NHS reference costs provide unit costs for a number of health care interventions. This data provides the average unit cost of A&E attendances for all NHS Trusts in England and Wales, and the average cost by type of A&E attendances (minor through to fatal A&E attendances). The number of A&E attendances by severity of attendance is not available at the London level. However using the proportions of English and Welsh A&E attendances by severity we are able to apportion London attendances into these categories. Applying the relevant 2001 unit costs gives an estimated average cost of £20.5 million (2002 figures).

Table A.11 in the appendix provides a detailed breakdown of the data.

#### *3.1.3.3. Outpatient attendances*

London data is available upon the total number of outpatient attendances, with 1,033,825 total attendances.<sup>31</sup> However, the number attributable to alcohol, or the cost per outpatient attendance is not available. As with the A&E data, we have estimated outpatient activity related to alcohol using data from other regions, suggesting that 8% of total attendances are

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<sup>27</sup> Number of admissions in 1999 was close to 11.1 million ([http://www.doh.gov.uk/hes/free\\_data/table198.html](http://www.doh.gov.uk/hes/free_data/table198.html)) resulting in total acute spend in the NHS of around £13,646 million. (<http://www.doh.gov.uk/dohreport/report2001/drchap6.pdf>).

<sup>28</sup> Data for 1999-2000 inflation taken from <http://www.statistics.gov.uk/STATBASE/tsdataset.asp?vlnk=229>.

<sup>29</sup> Department of Health, Outpatient and Ward Attendees, England, 1998-99 (KH09). [http://www.doh.gov.uk/hospitalactivity/statistics/1998-99/a\\_and\\_e\\_attendances/y10.htm](http://www.doh.gov.uk/hospitalactivity/statistics/1998-99/a_and_e_attendances/y10.htm).

<sup>30</sup> Catalyst (2001).

<sup>31</sup> Department of Health, Outpatient and Ward Attendees, England, 1998-99 (KH09). [http://www.doh.gov.uk/hospitalactivity/statistics/1998-99/outpatient\\_attendances/y10.htm](http://www.doh.gov.uk/hospitalactivity/statistics/1998-99/outpatient_attendances/y10.htm).

linked to alcohol misuse.<sup>32</sup> Assuming a similar trend in London, outpatient attendances due to alcohol are estimated to be 82,706 in 1998/9. The cost of an outpatient appointment is estimated at £101<sup>33</sup> resulting in total outpatient cost of £ 8.35 million.

#### 3.1.3.4. Ambulance transportation

Data suggests that in 2000, 4,283 ambulance call outs could be related to alcohol use.<sup>34</sup> Netten, Rees and Harrison (2001) have estimated the cost of paramedic and emergency ambulance services in the NHS at £474 (paramedic costs of £247, emergency ambulance costs of £188 and transport costs of £39). This suggests a total cost of £2.03 million for London.

### 3.1.4. Summary

Health costs due to alcohol occur at both the individual and NHS level. Table 3.3 provides a summary of these costs. Where a monetary value for the health cost is available this is also included.

**Table 3.3**  
**Health Costs Attributable to Alcohol**

Individual level	NHS level
Morbidity	<i>Primary care</i>
Mortality (£1,844, m)	GP and Practice nurse consultations (£2.7m)
	Laboratory tests (£2.5m)
	<i>Secondary care</i>
	Inpatient admissions (£15.6m)
	A&E attendances (£20.5m)
	Outpatient attendances (£8.4m)
	Ambulance transportation (£2.0m)

Source: NERA.

## 3.2. Costs of Crime

Alcohol contributes to a number of crimes. Besides costs to individuals, these crimes also affect the government in terms of costs involved in policing alcohol-related crimes and prosecuting criminals. Violent crime and road accidents attributable to alcohol may also lead to costs for the NHS. Besides estimating the cost of violent crimes and the cost of road accidents due to drunk driving, this section also estimates the cost of crimes such as robbery, burglary, theft, and criminal damage.

<sup>32</sup> Catalyst (2001).

<sup>33</sup> Matrix (2001).

<sup>34</sup> London Health Observatory analysis of London Ambulance Service NHS Trust data.

Crime data is collected at the London level on notifiable offences (i.e. offences that must be notified to the Home Office).<sup>35</sup> Table A.12 provides a breakdown of notifiable offences in London in 1999. However, there is no collected data that is able to distinguish between those that are alcohol-related and those that are not.<sup>36</sup>

Evidence collected from the British Crime Survey (a general population survey of private households in England and Wales) suggests that in forty per cent of violent crimes (excluding homicide) the victim thinks that the assailant was under the influence of alcohol (see Table A.14).

Bennett et al (1998)<sup>37</sup> surveyed arrestees in a small number of locations in England and Wales and found that 24% of males and 10% of females tested positive for alcohol (with an average of 22% for all arrestees) in their urine. The number testing positive for alcohol differs across offences - ranging from 75% for robbery to zero for fraud and deception. This data is reproduced in Table A.13 in the appendix.

Apart from notifiable offences, there are also a number of non-notifiable offences related to alcohol, including 'drunk and disorderly' and 'drunk and incapable'. These offences are not collected at the central level and are not therefore available.<sup>38</sup> (For a more detailed commentary on the relative lack of data on alcohol-related crime see Social Issues Research Centre (2001)).

### **3.2.1. Violent crime and alcohol in London**

Data on the number of recorded offences of violent crime is available at the London level from the Metropolitan Police.<sup>39</sup> Using the proportion of total crime related to alcohol suggested by the British Crime Survey (40 per cent), 59,000 incidents of violent crimes in 1998/9 (excluding homicide) are estimated to be related to alcohol.

The Home Office has undertaken a major study into the social and economic costs of crime and has provided estimates of the cost of violence against the person (encompassing all offences within this category) and more specifically for serious and other wounding and common assault.<sup>40</sup> The estimated costs of crime are reproduced in the appendix (Table A.15).

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<sup>35</sup> Metropolitan Police <http://www.met.police.uk/crimestatistics/index.htm>.

<sup>36</sup> Metropolitan Police personal communication to NERA November 2002.

<sup>37</sup> Bennett (2000).

<sup>38</sup> Metropolitan Police personal communication to NERA November 2002.

<sup>39</sup> Metropolitan Police, <http://www.met.police.uk/crimestatistics/index.htm>.

<sup>40</sup> Brand and Price (2000).

Applying these cost estimates to the proportion of violent crimes attributable to alcohol in London gives an estimate of £ 302 million (in 2000 prices).

### **3.2.2. Other crime and alcohol in London**

This report also tries to evaluate the cost of robbery, burglary, theft and handling, and criminal damage that could be related to alcohol use in London. Although, other crimes such as sexual offences or handling of stolen goods may also be significant, there is little data available on the proportion of these crimes that could be attributed to alcohol to form reasonable estimates.

Data on robbery, burglary, theft and handling, and criminal damage is available for London. Combining this data with the attribution rates provided by Bennett (2001) suggests that 125,000 offences were due to alcohol. Acknowledging that not all of these crimes may be solely due to alcohol (arrestees also had very high levels of illicit drugs use) we have reduced the attribution by half. This suggests that 62,000 offences may be due to alcohol.

The Home Office has also considered the cost of robbery, burglary, theft and criminal damage. We have combined the cost of these with the number of these offences that are attributable to alcohol. Applying these costs to the 62,000 offences gives an estimated cost of £90 million (2000 prices).

### **3.2.3. Traffic accidents involving alcohol**

The results of the breath tests of drivers involved in accidents in London<sup>41</sup> suggests that there were more than 1,151 accidents in London where the driver had consumed more than the legal limit of alcohol. However no information is available on the number of casualties involved in these accidents for London.

The Department of the Environment, Transport and the Regions collects data on the number of casualties and accidents involving alcohol in Great Britain. It shows that in 1999, there were 16,830 casualties involved in 11,010 accidents involving illegal levels of alcohol. Using the same level of casualties per accident for London would imply 1,760 casualties from the 1,151 road accidents related to alcohol in London.

The Department for Transport estimates the cost of road accident casualties in the UK, which we use to provide an overall cost of £1.28 billion in 2000 due to alcohol-related road accidents in London.

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<sup>41</sup> London Health Observatory analysis of Transport for London data.

### 3.2.4. Summary

There are considerable costs of alcohol-related crime. Table 3.4 provides a summary of the costs of crime due to alcohol in London, where quantification of costs was possible.

**Table 3.4**  
**Costs of Crime Due to Alcohol in London**

<b>Crime</b>	<b>Cost (£m)</b>
Violent crime	302
Robbery, burglary, theft and criminal damage	90
Alcohol-related traffic accident casualties	1,282
<b>Total</b>	<b>1,674</b>

Source: NERA.

### 3.3. Workplace Costs

Even at moderate consumption levels, alcohol can act as a depressant - impairing reasoning, memory, perception and co-ordination. Alcohol can hence be a cost to the employees, for example through absence from work, reduction in working hours per day, or lower productivity while working. In an extreme case employers might also need to replace the employee.

A fair amount of research has been done in the last two decades on assessing the impact of alcohol on employment. While it is clear that alcohol affects individuals' health and productivity, there are some studies that question the causal relationship between alcohol and some labour market outcomes such as its affect on wages (see Dave and Kaestner (2002) for references). However, most agree that alcohol dependent employees are less productive and may even take more days off sick than other people.

Much of the questions that surround the debate about the link between alcohol and employment are due to lack of data. In the UK, consistent time series data on regional sickness levels or the length of sickness absence is not available that could be used to compare the link between consumption of alcohol by employees and workplace productivity. The recent Labour Force Surveys provides some consistent information on sickness levels, but it still does not ask in detail the reasons for absence, which may include alcohol.

The effect of alcohol on employment is usually estimated under three heads - unemployment, loss of productivity, and absenteeism<sup>42</sup>. Unemployment is only a concern

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<sup>42</sup> Another important source of concern is premature mortality due to working population. For example, driving at work while under the influence of alcohol may cause death. However, these deaths would be part of the overall deaths attributable to alcohol use studied in Section 3.

where the economy of a region is facing full employment. Under such a condition, replacing an employee would be difficult. Although measuring full employment rate is difficult, it is notable that London's unemployment rate is 7.3% - well over the 5.7% rate for the UK in 2000.<sup>43</sup> Hence, It is likely that if an employee were discharged due to alcohol problems, a replacement would be available. Under such conditions the economy of London is unlikely to suffer much as the position would not be left vacant, and the only costs would be the replacement cost to the employer.<sup>44</sup>

Consumption of alcohol could also affect the economy by reducing productivity of employees. Impairment of senses due to excess alcohol consumption must affect the ability of workers to perform their tasks – both physical and intellectual. However, there is no data available that may inform about the extent of this problem.

Finally absenteeism or the extra days of absence for employees that consume alcohol is a major concern for the businesses. We have estimated the costs of absenteeism, using the "human capital approach". This approach takes into account the number of days lost to due to alcohol and values them at the average costs of an employee, after taking into account employer's cost (national insurance, pension etc)).

There are almost 3.5 million employed people (including self employed) in London in 2000. The labour force survey suggests that almost 3.2% of employees (111,904 employees) in London are absent in a usual week, a fraction higher than the 3.1% absence for the UK. Absence is much higher in women compared to men (2.9% for males and 3.6% for females).<sup>45</sup> A proportion of these are related to alcohol.

Estimating the proportion of the employees with a drinking problem is difficult. Some surveys infer the level of problem drinking by analysing questions that may indicate dependence on alcohol (Catalyst (2002)). In the absence of such data, we estimate the proportion of 'dependent' drinkers by looking at the proportion of men and women that 'usually' drink more than 50% of the prescribed 'safe' limit of alcohol.

Lader and Meltzer (2001) provide age-specific data on usual weekly consumption for men and women in 2000. Taking into account London's population demographics, it is estimated that more than 11% of men, on average, drank over 35 units of alcohol and 6% of women drank over 25 units in London. This would imply around 317,650 employees in London drink 50% more than the prescribed safe limits.

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<sup>43</sup> ILO employment rates taken from ONS (2002).

<sup>44</sup> Their might be some productivity effects as the reduction of an 'able' employee reduces the pool of employees available for work.

<sup>45</sup> The estimate takes into account the differences in population and economic activity rates between men and women in the UK.

It is well documented that alcohol dependent employees take more time off than the rest of the workforce. Different estimates suggest that employees that are dependent on alcohol use may take 2 to 5 times more time-off than other employees (Powell (1990), Hutcheson et al (1995), Catalyst (2002)). The Labour Force Survey (2000) suggests that the average number of days off per employee is 4 for men and 6 for women each year. Taking a conservative estimate and assuming alcohol dependent employees take 3 times more days off than the average, implies 1.68 million working days lost due to alcohol in London – almost 10% of the total working days lost due to sickness in London.

The average daily income per employee (including employment costs) in London is estimated at £200.<sup>46</sup> This implies that the total cost of absenteeism to London's economy is £294 million.<sup>47</sup>

### 3.4. Welfare Implications

It is clear that consumption of alcohol results in significant costs to the individual as well as the government and businesses. As said earlier much of these costs are related to high-end consumers and 'binge' drinkers, and our analysis in Section 2.2, shows that the extent of alcohol consumed varies by gender, age and minority ethnic groups.

Ideally the welfare analysis of the costs of alcohol would require analysis of each of the costs based on different population groups. However, data for such an exercise is not available. Hence, by looking at the relative consumption levels of different population groups we qualitatively assess which population groups are likely to cause more costs than others.

Section 2.2 shows that men drink more frequently than women, and when they do they consume more as well. The proportion of men that drink over 4 units of alcohol (roughly the safe limit of consumption for men) on their heaviest drinking day is 31% compared to only 19% that drank over 6 units for women. The average weekly consumption of men in London is 16.1 units compared to 8.2 units for women.<sup>48</sup>

There is also a clear trend between age and consumption of alcohol. Average weekly consumption as well the consumption level on the heaviest drinking day in the last week for both men and women, goes down with age. However, this trend is opposite when it comes

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<sup>46</sup> Estimated by dividing London's GDP to the total number of employees and inflating it to take into account employment costs. Employment costs are estimated to be 28% of net salary (see section 4.1.1). GDP figure for 2000 is estimated by inflating the 1999 by UK's GDP growth in 2000.

<sup>47</sup> Estimating social costs of alcohol on employment is complicated. Alcohol dependency, employment, wages are very different between social classes and age groups. It is also arguable whether the loss in output is equal to the daily employment costs. Hutcheson (1995) argues that work absence would not matter if the work not done on absent days is covered by higher productivity on other days, or if other colleagues cover the work. In the absence of knowing the causal relationship between alcohol, absenteeism and loss output, the estimate should not be considered a 'true cost'.

<sup>48</sup> See sections 2.2.2 and 2.2.3.

to under-age drinking. In the 11-15 age groups, the 15 years old drink far more than the 11 year olds.

Finally, Table 2.1 shows that 28% of London's population consists of ethnic minorities. Of these 90% are Black, Asian or Chinese - minority groups with considerably less consumption levels compared to the national level. The Irish on the other hand drink more than the average.

Based on the assumption that high-end consumers are a cause of the major costs of alcohol, and the main trends in consumption across different population groups one can assume that consumption of alcohol by women, older adults and minorities is less harmful to the society compared to their counterparts, as they drink less compared to them.

## **4. EVALUATION OF BENEFITS**

While a vast amount of literature is available on the individual and social costs of alcohol use, evaluation of the benefits has largely been ignored. There have been studies that have shown marginally better productivity of moderate drinkers compared to abstainers, as well as other studies showing possible health benefits of drinking wine. However, these benefits are debatable and their extent, at best, is marginal. The real benefit of alcohol lies in its consumption. The net direct benefit to the individual consumers is the “consumer surplus”, which is the extent to which value to consumers exceeds the prices which they pay. Very little data is available to estimate this. However, the social benefits of alcohol are broader than benefits that accrue directly to the alcohol consumer, being such an intricate part of the social culture.

The alcohol market also accounts for substantial consumer spending. Households spend up to 6% of their incomes on alcohol, plus more on complementing industries such as restaurants and hotels. The alcohol industry in London also undoubtedly has positive impact on the numbers who visit London.

Care has to be taken in assessing the value to society of particular kinds of employment. Although it may not appear so to the individual, the total level of employment or unemployment, in London or in the UK, is most unlikely to be materially affected by more or less restriction on alcohol. The people employed to provide alcohol related services are resource which would otherwise be providing other services. However the degree of freedom or restriction does affect on the social climate or atmosphere of the city, which does of course have a real effect on welfare. Alcohol also raises large quantities of taxation, which would otherwise need to be raised in ways, which would probably have more adverse effects on national income.

Many of these impacts are difficult to quantify, but some rough estimates can be made.

The following section considers: a) the distribution of alcohol expenditure between main stakeholders such as employees, businesses, and government; b) individual utility or pleasure from drinking; c) wider effects such as increase in employment in complementary industries.

### **4.1. Alcohol Expenditure and Stakeholders**

This section identifies the direct material consequences of alcohol consumption, for example, the profit to businesses in the supply chain of alcohol; the wages of employees; and the excise revenue for government. Many of these direct benefits are already quantified in a free market (such as salaries). In fact, in theory, the retail price of (or expenditure on) alcohol

includes all the cash flows that accrue at each level in the supply chain.<sup>49</sup> Hence, this report quantifies the main beneficiaries of the revenue that arises out of its sale.

In Section 2.2.1 it is estimated that the total expenditure on alcohol in London is close to £4.6bn. The following section estimate how this is distributed between different stakeholders.

#### 4.1.1. Employment

Local alcohol consumption absorbs employment at the manufacturer as well as the retail level. More than three-quarters of the alcohol consumed in the UK, by value, is produced locally. This varies substantially across drink types – for example 90% of the beer consumed is produced locally, where as only 25% of wines (including coolers such as flavoured alcoholic beverages) and 34% of spirits consumed are locally produced in 2000.<sup>50</sup> Hence most of the employment in the manufacturing side arises in the brewing industry. It is also notable that the UK exports a fair share of its production to other countries.

**Table 4.1**  
**Employment Related to Manufacturing of**  
**Alcoholic Drinks in the UK, 2000**

<b>Manufacturing of</b>	<b>Thousand</b>
Beer	22.7
Spirits	10.8
Cider, perry & other fruit wines	3.3
Malt	2.3
Wine	0.8
<b>Total</b>	<b>40.0</b>

*Source: NERA estimate using Annual Business Inquiry.*

Table 4.1 shows that local manufacturing of alcoholic drinks absorbs almost 40,000 direct jobs (including part time jobs)<sup>51</sup>. The estimation of employment in these industries that is attributable to consumption in London is not straightforward. However, assuming that it is directly proportional to the share of London in UK's total consumption (by value) implies that 13.7% of this employment or 5,500 jobs in the manufacturing of alcohol industry are related to the consumption of alcohol in London.

<sup>49</sup> In the free market only goods and services that are traded could be valued – therefore non-tradable or indirect benefits may not be part of the price.

<sup>50</sup> NERA estimate.

<sup>51</sup> This estimate is based on data from the Annual Business Inquiry (ABI). According to ABI the turnover of business with these jobs was around £10bn in 2000. Considering the £33bn UK market, it seems that, even with discounting for imports and smuggling (the employment related to their production is not part of ABI statistics), as well as margins for distributors and manufacturers, the turnover is well under the overall expenditure. If this means that ABI does not take into account all manufacturing units in their statistics, then the employment data in Table 4.1 underestimates total employment related to alcohol manufacturing in the UK.

Manufacturing only accounts for a small share of alcohol-related employment. In fact, most of the jobs related to alcohol are in the retail sector – in pubs and clubs for instance. However on these premises other goods might be sold as well and it is difficult to decipher how much of the time and cost of employees should be attributed to alcohol consumption.

According to a survey by the ONS, of the people who drink alcohol in the UK, over 70% of people buy alcohol from licensed pubs and bars; a similar proportion buys it from the supermarket; over 60% buy it with food in restaurants; and only 4% purchase alcohol from somewhere other than a retail outlet. The proportion of employees' effort related to sales of alcohol in supermarkets compared to other goods is fairly insignificant. Hence, this report assesses the employment related to alcohol by looking at licensed outlets such as pubs, restaurants and hotel with restaurants.

**Table 4.2**  
**Employment in Licensed Retailing and Selected**  
**Industries in the UK, 2000**

	<b>Total (thousand)</b>	<b>Proportion related to alcohol (%)</b>	<b>Alcohol-related employment</b>
Bars and Pubs	601	0.90 - 0.95	541 – 571
Restaurants	565	0.15 - 0.20	85 – 113
Hotels and motels with restaurants	322	0.10 - 0.15	32 – 48
<b>Total</b>	<b>1,488</b>		<b>658 – 732</b>

*Source: NERA estimate using Beer and Pub Association (2001).*

Table 4.2 shows that around 1.5 million jobs are involved in industries that retail alcoholic beverages in the UK. Of these, more than 0.6 million jobs in pubs and bars can be assumed to be mostly involved with the sale of alcohol. However, employees in restaurants and hotels have other responsibilities and there is no information available to explain how many jobs in these industries are directly related to alcohol. Hence, the table uses some sensitivities to look at the possible magnitude of the jobs.

Assuming that 90-95% of the jobs in bars and pubs; and 15-20% in restaurants; and 10-15% in hotels and motels could be related to the consumption of alcohol, Table 4.2 shows that more than 0.66 million jobs could be related to the sale of alcohol in the UK.

There are more than 82,288 pubs and clubs in the England and Wales in 2001 - of these, 9,527 are within London. Of the 20,330 restaurants in the UK, 4,699 are in London.<sup>52</sup> Similarly, only 7% of the 7,232 hotels in England are in London. By inflating England and Wales' data to UK using population differences, assuming a similar staff per premise ratio in London compared to the UK, and comparing the number of UK retail premises to London, it is

<sup>52</sup> Home Office (2002).

estimated that retail of alcohol generates more than 76,778 jobs in London (assuming 0.66m jobs in the UK). Therefore, combining manufacturing and retailing of alcohol generates more than 82,278 jobs (including part-time).

*Valuing the financial consequences of these jobs*

The real benefit of these jobs to the individual is the disposable salary, but to the industry the total employment costs of an employee are more than just the salary. The employment costs include amongst other things income tax and national insurance contributions. Table 4.3 presents estimates of the employment costs across different industries related to alcohol.

**Table 4.3**  
**Employment Costs (Including Part-Time) Across Different Industries in London, 2000**

	UK (£per employee per Year)	London+ (£per employee per Year)	Employees (thousand)	Total Cost (£m)
Manufacture of brewing and alcoholic beverages	26,575	26,575	5.5	146
Pubs and clubs	5,241	7,652	56.9 – 60.1	298 – 315
Restaurants	5,873	8,574	17.8 – 23.7	105 – 139
Hotel and motels	8,503	12,415	2.0 – 3.0	17 – 26
<b>Total</b>			<b>82.3 – 92.4</b>	<b>566 – 627</b>

*Source: Annual Business Inquiry.*

+ Income per capita in London is 46% more compared to the rest of the country (see Table 2.1). We have increased salaries in London to reflect that. The salaries in the manufacturing industry are not increased as most manufacturing sites are outside London.

Table 4.3 shows that the estimated employment cost of selling alcohol are well over half a billion pounds in 2000 – implying that 13% of total revenue is spent on employment costs in the alcohol industry. The estimated employment costs are low for the retail industry per number of employees when compared to average income per capita of £18,979 (see Table 2.1). This perhaps reflects the large proportion of part-time employees in the workforce of the retail industry. The figures suggest that over half the employment costs rest with pubs and clubs, and a quarter are related to manufacturing industry.

Included in these costs are income taxes and national insurance contributions. Looking at the average employment cost, it seems that most of these employees would be in the ‘basic income tax rate’ (applied at income over £6,335 in 1999-00).<sup>53</sup> Data from the Inland Revenue

<sup>53</sup> Many employees would be below the basic rate of tax, especially part-timers, and some would also be over the basic rate such as people in the managerial levels. However, little data is available on the distribution of incomes in the retail and the manufacturing industry in London.

suggests that average tax rate for basic rate tax payers is around 13%.<sup>54,55</sup> Similarly, assuming a national insurance contribution of around 15% for people at this income level, the proportion of these employment costs directly benefiting the government are 28% or £159m - £175m in 2000. This implies a benefit to the employees (including pensions etc) ranging between £408m to £451m.

#### 4.1.2. Profit margins

We have contacted the British Beer and Pub Association and other industry level contacts for information on the profit margins involved in the sale of alcohol at the manufacturing, distribution and retail level. However, this information is unavailable in the public domain. There is also little information available about the additional costs involved at the distribution and retail level, or the level of corporation tax paid just by the alcohol industry.

In the absence of such data we have estimated the profit margin on the basis of information available in the *Annual Business Inquiry* on gross value added (GVA), staff costs and capital expenditure in alcohol-related manufacturing industries, and retailers. Assuming gross profits to be equal to be the difference between GVA and staff and capital cost, Table 4.4 presents the profit margins in selected industries.

**Table 4.4**  
**Estimated Gross Profit Margins in Selected Industries, 2000**

	%
Manufacturing of beverages	15.7%
Bars	9.8%
Restaurants	14.3%
Hotels and motels with restaurants	20.1%

*Source: Annual Business Inquiry.*

In the absence of the split between the proportion of sales in pubs, restaurants and hotels, we have assumed an average 15% profit margin at the retail level. Also, we have assumed 25% distribution costs.<sup>56</sup> These assumptions imply that the gross average profit for retailers is around £167m and for manufacturers its £484m.

On this profit, firms need to pay corporation tax. In 1999-2000, the average corporation tax paid by firms on profits was 21.4%.<sup>57</sup> Using this figure, the net benefit to the retailers of

<sup>54</sup> The average tax rate is the amount of income tax paid compared to the nominal income.

<sup>55</sup> Source: <http://www.inlandrevenue.gov.uk>.

<sup>56</sup> Data on level of distributional costs is not available, hence the 25% costs figure is a guesstimate based on discussions with industry level contacts.

<sup>57</sup> Source: <http://www.inlandrevenue.gov.uk>.

alcohol sales is £137m and for manufacturers it is £399m. The revenue for the government is around £115m.

However we must here repeat the “health warning”, that if the resources employed in producing alcohol related products and services were not engaged in these activities they would be available to produce other goods and services instead. The wages and profits attributable to alcohol therefore are not measures of social benefit attributable to alcohol. The social benefits lie in its consumption. However figures on the production of alcohol related activities provide a measure of their importance today of the national and local economy, and of the transitional costs which would arise were it to markedly contract.

#### 4.1.3. Government revenue

The revenue from income taxes and national insurance contribution, as well as corporation tax is a very small share of the overall income that is generated for the government by the sale of alcohol. These taxes might still arise if the resources were producing other goods and services instead. However, there are other specific taxes on the consumption of alcohol that are high. Moreover, a substantial proportion of alcoholic drinks are imported and customs and excise duty are applied over it. Finally, at the retail level an additional 17.5% value added tax (VAT) is applied as well. All in all Customs and Excise duty and VAT account for a third of the value of all sales of alcohol.

**Table 4.5**  
**Estimated Government Revenue from Taxes and Custom Duties**  
**Related to Sale of Alcohol in the UK and London, 2000 (£m)**

	Beer	Cider and Wine	Spirits	Total
<b>UK*</b>				
Total Sales <sup>+</sup>	16,414	10,368	6,801	33,583
Custom and Excise revenue	2,813	1,812	1,804	6,429
VAT	2,487	1,513	1,031	5,030
<b>Total revenue for the government</b>	<b>5,300</b>	<b>3,325</b>	<b>2,835</b>	<b>11,459</b>
<b>London</b>				
Total Sales <sup>+</sup>	2,257	1,425	935	4,617
Custom and Excise revenue	387	249	248	884
VAT	342	208	142	692
<b>Total revenue for the government</b>	<b>729</b>	<b>457</b>	<b>390</b>	<b>1,575</b>

\*Source: Beer and Pub Association (2001).

<sup>+</sup> Estimated in Section 2.2.

Table 4.5 shows that the government receives about £1.6bn from various duties and taxes on alcohol in London. This is well over 34% of the total expense on alcohol in London. The table shows that, of the revenue, 15% is taken by the government, on average, under the head of VAT. The rest of it is taken as duty, which averages around 17% for beer, cider and

wine; and over 26% on spirits. If this were added to the income tax on salaries and corporation tax, the net government revenue associated with alcohol consumption in London is approaching £1.9bn.

**Figure 4.1**  
**The Cost of a Pint of Beer**

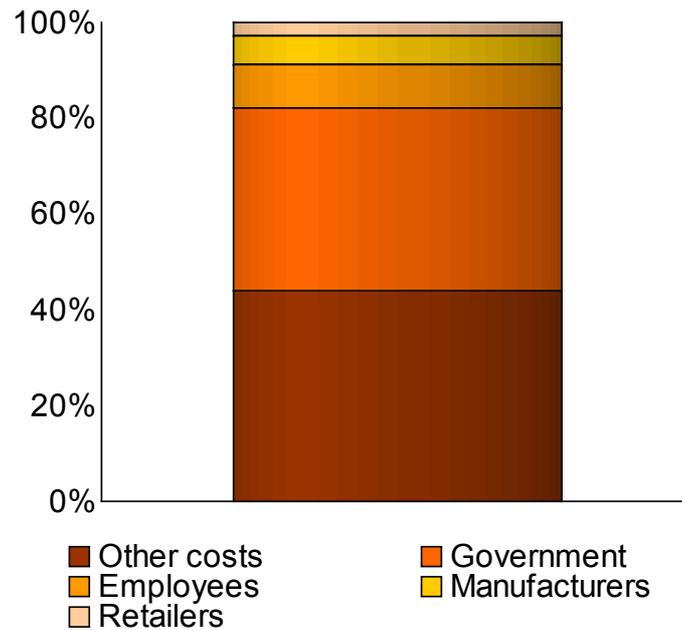


Figure 4.1 shows the share of the sale price of the sale of a pint of beer flowing to different stakeholders. It shows that for every pound spent on beer in London, 38p goes to the government; 9p to salaries of employees; 3p as profit to the retailers; 6p as profit to the manufacturers; and the rest goes in the manufacturing and distribution costs that include ingredient and capital costs.

## 4.2. The Pleasure from Drinking

Section 4.1 shows how the price of a pint is shared between different stakeholders. However, in reality even with all the taxes and profits, when the consumer decides buy a pint of beer, to him or her the utility of having beer must be at least enough to compensate for the price paid. Hence, the pleasure of drinking is worth at least as much as the price to the consumer. Some consumers would choose to buy it, even if the price had been higher. The highest price a consumer would have been willing to pay for a pint of beer is known as willingness to pay. The difference between what the consumer is willing to pay and what is actually paid is termed as the 'consumer surplus'.

Measuring willingness to pay, or the demand curve of an individual, is difficult. There is often very little data to show how demand changes with price, especially over a wide range. Consumer preferences change over time and with different consumption levels. However, the consumer surplus is critical to understanding the real worth of alcohol to the consumer. Appendix B discusses in detail how we have evaluated the demand curve and the consumer surplus for different drink types in London based on point estimates of consumers' response to price changes in the UK. However, it must be noted that these point estimates do not present the real long-term demand curve of the individual, and as such the estimated results here are only indicative.

**Table 4.6**  
**The Pleasure from Drinking Alcohol in London (£m)**

	<b>Beer</b>	<b>Cider</b>	<b>Wine</b>	<b>Spirits</b>	<b>Total</b>
Total spend on alcohol	2,257	197	1,228	935	<b>4,617</b>
Willingness to spend on alcohol	3,385	296	1,842	1,403	<b>6,926</b>
Estimated consumer surplus	1,128	99	614	468	<b>2,309</b>

*Source: NERA estimate.*

Table 4.6 suggests that the real pleasure of drinking alcohol to consumers in London, as depicted by their willing to pay, is around 50% more than what they actually spend purchasing it. In other words, Londoners pay around £4.6bn for consuming alcohol, they would be willing to pay another £2.3bn for it as they value the present consumption more than what they pay for it. (Although this does not mean that if produces put up the price by this amount they could capture this surplus. They would not, because consumers vary widely. If the price were increased those consumers whose willingness to pay is already close to market price would reduce their purchases and the supplier would loose all of that sales revenue.)

### **4.3. Wider Benefits**

Besides the direct benefits to those involved in sale of alcohol and the consumption of alcohol, there are other wider economic and social consequences of the presence of alcohol. Pubs and clubs are places of social gathering and form the backbone of the entertainment industry in the UK. For many businesses, alcohol is almost a 'necessary' complement. For others its absence would cause a substantial reduction in economic activity.

The financial flows created by the use of alcohol are not studied in detail in research. There is little commentary or data available on how consumption of other goods is complemented by alcohol use. In the following paragraphs we point out some indicative numbers to show the extent of linkages to the use of alcohol in London. The sections look at the wider economic activity, late night economy and tourism as an indicator of how alcohol can affect consumption, and affect the distribution of income and employment in London. (It is notable that these three areas are interlinked and hence there is overlap in the benefits.)

#### 4.3.1.1. *Wider economic activity*

As mentioned earlier, a wide variety of businesses are affected by the use of alcohol. According to Annual Business Inquiry, turnover in hotels and restaurants is almost £800 per capita in the UK in 2000 (implying almost £6bn for London).<sup>58</sup> More than 1.7 million jobs are associated with these businesses. While, only a fraction of these are directly involved in the sale of alcohol, if the absence of revenue related to alcohol were to affect only 20% of the sales –over a billion pounds of business in London could be said to depend on alcohol.

#### 4.3.1.2. *The late night economy*

While isolating the impact of alcohol on complementing businesses is difficult, some key economic centres in London are bound to be affected. According to a report on the late night economy in London by the GLA<sup>59</sup>, more than half a million people go out clubbing regularly in London on a Saturday night. It is seen as a main part of London's city life. It also is strongly linked to over 300,000 jobs involved in the entertainment industry in London. Assuming these workers also include part-time workers and the overall earnings average half of the average per capita income of £18, 979 in London in 2000 (see Table 2.1), a rough estimate of the private income for employees related to London's late night economy is around £2.8bn.

Alcohol is seen as a crucial link to the late night economy – both in terms of cost and benefits. Without alcohol, the late night economy would be substantially less than what it is now.

#### 4.3.1.3. *Tourism*

Tourism is another major industry in the UK and in London. In 2000, it contributed over £75bn to the UK economy (4.5% of GDP) – half in the form of tourist spend (the other half includes day trips and fares to UK carriers). Only a fifth of the spending by the tourists was on business trips, the rest was on holidays or visiting friends and families. The vast majority of the overseas tourists are from countries where alcohol consumption is very much part of social life.

London is a major part of UK's tourist industry. It attracts almost a quarter of the total spend by tourists in the UK (£8.9bn). According to some estimates of the 2.1 million employees (some 7% of total employment in Great Britain) related to tourism in the UK, 0.3 million are in London. Their numbers are growing by almost 20% per year.<sup>60</sup>

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<sup>58</sup> Annual business Inquiry, <http://www.statistics.gov.uk/abi/default.asp>.

<sup>59</sup> GLA (2002).

<sup>60</sup> Data taken from StarUK dataset: [www.staruk.org.uk](http://www.staruk.org.uk).

While alcohol may not encourage tourist spend, the absence of alcohol may deter some tourists from visiting London. There is no data available to suggest what that number might look like – but a conservative estimate of a 10% reduction in spending would imply £890m loss of tourist turnover for London.

While looking at these numbers it is important to note that we are not isolating the impact of alcohol on tourism. Of the 0.3 million jobs in the tourism industry almost one-third are in hotels in restaurants which are also linked to the jobs in the late night economy or the ones mentioned under wider economic activity. Also, the spending levels mentioned include spend on alcohol which is already valued under direct benefits. The purpose of this section is to point out that alcohol is a contributor to these industries. Hence, its consumption contributes to the turnover for businesses, employment incomes, and tax revenues.

#### **4.4. Welfare Implications**

There is very little data available for any welfare analysis of the differences in the flows of finances across genders, age and minority groups in the alcohol industry. While we discuss the consumption patterns of alcohol across these population groups, we do not know differences in willingness to pay across these groups to get an idea of the consumer surplus related to these groups.

We tried to gather information on the proportion of women employees in alcohol related industries from the British Beer and Pub Association. However, this information was not available. Ideally, this data could be used in attributing the earnings in the manufacture and retail of alcohol between genders. Similar data for minority ethnic groups was also not available.

Working in bars and restaurants, as well as other part-time work in the entertainment industry, is potentially a big source of employment for young people. Hence, they are also important beneficiaries of the employment earnings in the alcohol industries.

Finally, by far the most important beneficiary of alcohol-related financial flows is the government. The revenue that London's alcohol consumption provides to the government in terms of taxes and duties could be used to redistribute income more efficiently.

## 5. CONCLUSIONS

The purpose of this study is to contribute to the debate about the use and effects of alcohol in London. This study gathers a wide array of information about the market for alcohol in London and illustrates the main costs, benefits and financial flows that arise of its use. Many of the consequences of alcohol are not quantifiable due to lack of data. Even where data is available, we have often had to adapt assumptions to be London-specific.

Table 5.1 summarises the information that this report has evaluated on the financial flows associated with alcohol and of the social benefit provided by the consumer surplus. We do not find it practicable to value the extent to which London is a “better place to be” as a consequence of a more or less liberal alcohol regime.

**Table 5.1**  
**Financial Consequences and Consumer Surplus**  
**from Alcohol in London (2000 Prices)**

<b>Total expenditure on alcohol</b>	£4.62 billion
<b>Main beneficiaries</b>	
Income for employees	£0.41-0.45 billion
Profits for businesses	£0.54 billion
Revenue for government (including taxes on employee incomes and corporate earnings)	£1.85-1.87 billion
<b>Net social and economic benefits:</b>	
<b>Consumer surplus</b>	£2.31 billion
Wider benefits (e.g. ‘quality of life’, efficient revenue collection)	Not quantified

*Source: NERA estimates.*

Table 5.2 records some tentative figures on the costs of alcohol misuse.

**Table 5.2**  
**Costs of Alcohol in London (2000 Prices)**

<b>Main Costs:</b>	
Mortality costs to the individual	£1.84 billion
Health costs to the NHS	£0.05 billion
Morbidity and other costs	Not quantified
Crime (does not include all criminal activities)	£0.39 billion
Drunk driving	£1.28 billion
Absenteeism	£0.30 billion
Other costs to businesses	Not quantified

*Source: NERA estimates.*

Table 5.1 shows that alcohol expenditure in London results in almost £1 billion of revenue that flows to individuals and businesses that are involved in its sale in London. Government receives a little less than twice that amount in the form of taxes and duties. However, all this comes at a cost.

The misuse of alcohol results in substantial numbers of deaths in London. The total mortality directly or indirectly related to alcohol cost over £1.84 billion to London. We expect a substantial morbidity cost as well, which we have not been able to estimate due to lack of data. However it is clear that the physiological and psychological effects of alcohol abuse are detrimental to the economy. Apart from individual harm that alcohol may inflict, we have also estimated some of the costs that relate to treating patients that use alcohol in the NHS. These costs are estimated at £52 million.

Finally, while we have not been able to quantify all the costs that businesses expect to face due to alcohol use, estimates of cost of absenteeism due to alcohol are substantial. Our estimates suggest that just absenteeism related to alcohol in London costs the economy £0.3 billion.

Even with these substantial potential costs, individuals choose to consume alcohol. Although only indicative, our analysis of the “pleasure of drinking” from alcohol shows that consumption of alcohol is worth £ 2.3 billion more than what consumers pay for it.

It is also clear from our analysis that besides individual pleasure the alcohol industry complements billions of pounds of expenditure by consumers in the form of expense on tourism or late night activities. While this is not a direct social benefit per se, it is important to recognise the contribution that alcohol makes in sustaining this economic activity and its contribution to the quality of life.

Quantifying the social costs and benefits of alcohol is not an exact science. However we have illustrated at each step of the estimation our assumptions, which readers should look at to form their own judgements. Based on those assumptions, this report shows that in dealing with policy related to alcohol use, one has to take particular notice of issues such as mortality cost or the pleasure from drinking. Still it is important to see that many of the costs and benefits are not assessed in this report and their affects can also be substantial.

These figures should be regarded as broad indicators of some of the financial and other quantities associated with alcohol in London. The extent to which they measure true social costs and benefits varies widely and they do not provide a set of figures from which to derive a total net benefit (or disbenefit) of alcohol. Nor do they provide direct information about the effects of marginal changes in the regime of alcohol regulation. They do however provide some quantitative infill for the very complex place which alcohol has in the life of London.

## APPENDIX A. BACKGROUND DATA

### A.1. Market for Alcohol

**Table A.1**  
**Trend in Income and Prices in the UK (Index 1985=100)**

Year	Income	RPI (all items)	Beer	Cider	Wine	Spirits
1985	100	100	100	100	100	100
1986	104	103	104	106	103	106
1987	108	108	109	111	106	110
1988	114	113	114	117	110	117
1989	119	122	121	125	115	125
1990	123	133	132	137	125	135
1991	125	141	149	155	140	149
1992	130	146	158	165	149	158
1993	134	149	165	174	154	167
1994	135	152	169	179	156	174
1995	139	158	176	187	161	181
1996	142	161	181	193	164	188
1997	147	166	186	200	167	195
1998	147	172	192	208	171	203
1999	153	175	197	215	174	210
2000	157	180	200	219	175	218

Source: ONS (2001a) and Beer and Pub Association (2001).

### A.2. Health Costs

**Table A.2**  
**Direct Mortality due to Alcohol by Gender for England and Wales 1999**

	Alcoholic psychoses	Alcohol dependence syndrome	Non-dependent abuse of alcohol	Alcoholic cardiomyopathy	Chronic liver disease and cirrhosis	Toxic effect of alcohol	Total
Men	13	220	109	109	2,904	99	3,454
Women	9	105	49	28	1,814	49	2,054
Persons	22	325	158	137	4,718	148	5,508

Source: ONS (2001a).

**Table A.3**  
**Indirect Attribution of Alcohol to Mortality by ICD 9 Code**

ICD code	Disease	Percentage of deaths attributable to alcohol	
		Male	Female
140-239	Neoplasm	4	3
430-438	Cerebrovascular Disease	12	3
460-519	Respiratory Disease	11	2
520-570	Disease of the Digestive System	12	3
800-999	Other	6	1

*Source: Adapted from Godfrey and Hardman (1994).*

**Table A.4**  
**Male Mortality in England by ICD 9 Code 1999**

ICD 9 code	Item	Frequency per million population	Mortality	Proportion of mortality
001-139	Infectious and parasitic diseases	70	1,706	0.01
140-239	Neoplasm	2,689	65,984	0.27
240-279	Endocrine, nutritional and metabolic diseases and immunity disorders	132	3,242	0.01
280-289	Diseases of blood and blood forming organs	32	788	0.00
320-389	Diseases of the nervous system and sense organs	186	4,558	0.02
430-438	Cerebrovascular	789	19,364	0.08
390-459	Diseases of the circulatory system	3,985	78,442	0.32
460-519	Diseases of the respiratory system	1,666	40,891	0.17
571	Chronic liver disease and cirrhosis	111	2,727	0.01
520-579	Diseases of the digestive system	373	6,430	0.03
580-629	Diseases of the genitourinary system	120	2,953	0.01
630-676	Complications of pregnancy, childbirth and the puerperium	-	-	-
680-709	Diseases of the skin and subcutaneous tissue	13	312	0.00
710-739	Diseases of the musculoskeletal system and connective tissue	36	884	0.00
740-759	Congenital anomalies	22	542	0.00
760-779	Certain conditions originating in the perinatal period	3	61	0.00
780-799	Symptoms, signs and ill defined conditions	130	3,191	0.01
800-999	External causes of injury and poisoning	395	9,682	0.04

Source: ONS (1999).

**Table A.5**  
**Female Mortality in England by ICD 9 Code 1999**

ICD 9 code	Item	Frequency per million population	Mortality	Proportion of mortality
001-139	Infectious and parasitic diseases	65	1,646	0.01
140-239	Neoplasms	2,439	61,475	0.23
240-279	Endocrine, nutritional and metabolic diseases and immunity disorders	151	3,794	0.01
280-289	Diseases of blood and blood forming organs	37	943	0.00
320-389	Diseases of the nervous system and sense organs	197	4,969	0.02
430-438	Cerebrovascular	1,312	33,076	0.12
390-459	Diseases of the circulatory system	4,216	73,200	0.28
460-519	Diseases of the respiratory system	2,008	50,622	0.19
571	Chronic liver disease and cirrhosis	67	1,687	0.01
520-579	Diseases of the digestive system	442	9,451	0.04
580-629	Diseases of the genitourinary system	153	3,865	0.01
630-676	Complications of pregnancy, childbirth and the puerperium	1	30	0.00
680-709	Diseases of the skin and subcutaneous tissue	31	782	0.00
710-739	Diseases of the musculoskeletal system and connective tissue	99	2,483	0.01
740-759	Congenital anomalies	22	557	0.00
760-779	Certain conditions originating in the perinatal period	2	43	0.00
780-799	Symptoms, signs and ill defined conditions	431	10,866	0.04
800-999	External causes of injury and poisoning	222	5,594	0.02

Source: ONS (1999).

**Table A.6**  
**Male and Female Indirect Alcohol Mortality by ICD 9 Code London 1999**

ICD 9 code	Item	Male mortality	Female mortality
001-139	Infectious and parasitic diseases	221	206
140-239	Neoplasms	8,554	7,698
240-279	Endocrine, nutritional and metabolic diseases and immunity disorders	420	475
280-289	Diseases of blood and blood forming organs	102	118
320-389	Diseases of the nervous system and sense organs	591	622
430-438	Cerebrovascular	2,510	4,142
390-459	Diseases of the circulatory system	7,659	5,025
460-519	Diseases of the respiratory system	5,301	6,340
571	Chronic liver disease and cirrhosis	353	211
520-579	Diseases of the digestive system	480	972
580-629	Diseases of the genitourinary system	3,826	484
630-676	Complications of pregnancy, childbirth and the puerperium	0	4
680-709	Diseases of the skin and subcutaneous tissue	40	98
710-739	Diseases of the musculoskeletal system and connective tissue	114	311
740-759	Congenital anomalies	70	70
760-779	Certain conditions originating in the perinatal period	8	5
780-799	Symptoms, signs and ill defined conditions	413	1,361
800-999	External causes of injury and poisoning	1,255	701

Source: NERA calculations.

**Table A.7**  
**A&E attendances by Severity of Attendance and Average Cost England and Wales 2002**

<b>HRG Code</b>	<b>HRG Label</b>	<b>Attendances</b>	<b>Proportion</b>	<b>Average cost (£)</b>
DOA	Dead on Arrival	36,990	0.3%	32
V01	High Cost Imaging (Died / Admitted)	78,258	0.6%	182
V02	High Cost Imaging (Referred / Discharged)	141,457	1.2%	111
V03	Other High Cost Investigation (Died / Admitted)	774,521	6.4%	122
V04	Other High Cost Investigation (Referred / Discharged)	2,361,417	19.4%	75
V05	Lower Cost Investigation (Died / Admitted)	892,172	7.3%	96
V06	Lower Cost Investigation (Referred / Discharged)	1,741,620	14.3%	59
V07	No Investigation (Died / Admitted)	793,475	6.5%	86
V08	No Investigation (Referred / Discharged)	4,193,515	34.5%	47
U06	Attendance Disposal Invalid For Grouping	1,133,700	9.3%	57

Source: DH Reference costs 2002 <http://www.doh.gov.uk/nhsexec/refcosts.htm>.

**Table A.8**  
**A&E Attendances by Severity of Attendance and Average Cost London 1999 Activity**

HRG code	HRG label	Assuming 12% due to alcohol	
		Attendances	Average cost (£)
DOA	Dead on Arrival	928	29
V01	High Cost Imaging (Died / Admitted)	1,962	356
V02	High Cost Imaging (Referred / Discharged)	3,547	392
V03	Other High Cost Investigation (Died / Admitted)	19,422	2
V04	Other High Cost Investigation (Referred / Discharged)	59,216	4
V05	Lower Cost Investigation (Died / Admitted)	22,372	2
V06	Lower Cost Investigation (Referred / Discharged)	43,673	2
V07	No Investigation (Died / Admitted)	19,897	1
V08	No Investigation (Referred / Discharged)	105,158	4
U06	Attendance Disposal Invalid For Grouping	28,429	1

*Source: NERA calculations.*

**Table A.9**  
**NHS Hospital Admissions for Primary and Secondary\* Diagnosis of Alcohol-Related Diseases London 2000/01**

		Male	Female	Persons
F10.0	Acute intoxication	1,270	500	1,800
F10.1	Harmful use	1,360	430	1,810
F10.2	Dependence syndrome	2,460	870	3,390
F10.3	Withdrawal state	1,080	300	1,380
F10.4	Withdrawal state with delirium	210	50	260
F10.5	Psychotic disorder	70	30	100
F10.6	Amnesic syndrome	30	20	60
F10.7	Residual and late onset psychotic disorder	60	20	80
F10.8	Other mental and behavioural disorders	0	0	10
F10.9	Unspecified mental and behavioural disorders	60	20	80
K70	Alcoholic liver disease	1,910	750	2,660
T51	Toxic effect of alcohol	310	310	620
<b>Total</b>		<b>8,840</b>	<b>3,300</b>	<b>12,250</b>

Source: London Health Observatory.

\* Diagnosis 2 through to 7.

**Table A.10**  
**NHS Hospital Admissions for Health Authorities in the Greater London Area 1998/9**

London Health Authority	Number of inpatient admissions by residence of HA
QA2 Hillingdon HA	46
QA3 Kensington, Chelsea & Westminster	59
QA4 Enfield & Haringey HA	94
QA5 Redbridge & Waltham Forest HA	90
QAP Barking & Havering HA	76
QAQ Barnet HA	57
QAR Brent & Harrow HA	82
QAT Camden & Islington HA	77
QAV Ealing, Hammersmith & Hounslow	125
QAW East London & The City HA	126
QAA Bexley & Greenwich HA	89
QAC Bromley HA	62
QAD Croydon HA	58
QAG Kingston & Richmond HA	50
QAH Lambeth, Southwark & Lewisham HA	146
QAJ Merton, Sutton & Wandsworth HA	119
	1,362,783

Source: <http://www.doh.gov.uk/hes/tables/tb00998e.xls>.

**Table A.11**  
**Average A&E Cost of Treatment**

<b>HRG code</b>	<b>HRG label</b>	<b>Number of attendances</b>	<b>Mean average cost (£)</b>	<b>Total costs (£)</b>
DOA	Dead on Arrival	928	32	0.03
V01	High Cost Imaging (Died / Admitted)	1,962	182	0.36
V02	High Cost Imaging (Referred / Discharged)	3,547	111	0.39
V03	Other High Cost Investigation (Died / Admitted)	19,422	122	2.36
V04	Other High Cost Investigation (Referred / Discharged)	59,216	75	4.45
V05	Lower Cost Investigation (Died / Admitted)	22,372	96	2.16
V06	Lower Cost Investigation (Referred / Discharged)	43,673	59	2.58
V07	No Investigation (Died / Admitted)	19,897	86	1.72
V08	No Investigation (Referred / Discharged)	105,158	47	4.90
U06	Attendance Disposal Invalid for Grouping	28,429	57	1.61
	<b>Total Costs</b>			<b>20.55</b>

Source: <http://www.doh.gov.uk/>.

### A.3. Crime Costs

**Table A.12**  
**Notifiable Offences London 1999**

<b>Notifiable offence</b>	<b>Number</b>
Murder	170
GBH	5367
ABH	34560
Common Assault	71056
Offensive Weapon	5746
Harassment	22279
Other Violence	8370
Violence Against the Person Total	147,548
Rape	2159
Other Sexual	6503
Sexual Offences Total	8662
Personal Property	30971
Business Property	4025
Robbery Total	34996
Burglary in a Dwelling	74531
Burglary in Other Buildings	44645
Burglary Total	119176
Theft/Taking of M/V	58819
Theft From M/V	103748
M/V Interference & Tampering	3629
Theft From Shops	44609
Snatches	10710
Picking Pockets, etc	24083
Theft/Taking of Pedal Cycles	17420
Other Theft	132383
Handling Stolen Goods	2694
Theft and Handling Total	398095
Counted per Victim	96204
Other Fraud & Forgery	1760
Fraud or Forgery Total	97964
Criminal Damage To a Dwelling	37011
Criminal Damage To Other Bldg	22339
Criminal Damage To M/V	64951
Other Criminal Damage	15587
Criminal Damage Total	139888
Drug Trafficking	3129
Possession Of Drugs	21252
Other Drug Offences	460
Drugs Total	24841
Going Equipped	933
Other Notifiable	8808
Other Notifiable Offences Total	9741

Source: <http://www.met.police.uk/crimestatistics/index.htm>.

**Table A.13**  
**Proportion of Arrestees Testing Positive for Alcohol by Offence Type**

<b>Offence</b>	<b>Proportion testing positive for alcohol</b>
Robbery	75
Burglary dwelling	8
Burglary non-dwelling	17
Theft from vehicle	0
Theft of/taking vehicle	30
Theft shoplifting	7
Theft other	13
Handling	25
Fraud/deception	0
Criminal damage	29
Drugs supply	13
Drugs possession	26

*Source: Bennett (2000).*

**Table A.14**  
**Number of Violent Offenders Under the Influence of Alcohol, 2000**

<b>Whether under the influence of drink</b>	<b>All violence</b>	<b>Domestic</b>	<b>Mugging</b>	<b>Stranger</b>	<b>Acquaintance</b>
Yes	40	44	17	53	36
No	50	55	68	34	54
Don't know	9	2	15	13	10
Base	1,052	229	125	308	390

*Source: ONS (2001a).*

**Table A.15**  
**Cost of Crime, UK 2000 (£)**

	<b>Violence against the person</b>	<b>Serious Wounding</b>	<b>Other wounding</b>	<b>Common assault</b>
Security expenditure	2	10	0	0
Insurance administration	0	0	0	0
Property stolen and damaged	0	0	0	0
Emotional and physical impact on victims	13,000	97,000	120	240
Lost output	2,500	14,000	400	20
Victim services	10	6	6	6
Health services	1,200	8,500	200	0
CJS	2,700	1,300	1,300	270
Average cost	19,000	130,000	2,000	540
Security expenditure	2	10	0	0

*Brand and Price (2000)*

## APPENDIX B. THE PLEASURE FROM DRINKING

It is important to know the benefit or the pleasure of alcohol to the consumer. As long as the pleasure of drinking in monetary terms is higher than the price, the consumer will consume alcohol. In other words the pleasure from alcohol has to be at least as much as the price paid for it. However, for many consumers the value of a pint of beer is higher than the prevailing price. Consumer surplus tries to measure this additional value to the consumers over and above the price they pay.

To estimate the consumer surplus, we make use of the fact that the demand curve gives us the prices that consumers would be willing to pay for each quantity. A simple illustration of this is shown in Figure B.1. It shows a downward sloping demand curve in line 'bcd', with the prevailing price and quantity as  $P^*$  and  $Q^*$  respectively. For all the units of the product sold before  $Q^*$ , the consumers are willing to pay an amount indicated by the height of the demand curve. The difference between the height of the demand curve and  $P^*$  gives the consumer surplus for each quantity. Therefore for the first unit, the consumer surplus is equal to the difference between point 'b' and 'a'. Aggregating the consumer surplus till  $Q^*$  gives us the total consumer surplus, indicated by the area 'abc' in Figure B.1.

**Figure B.1**  
**Measuring Consumer Surplus**

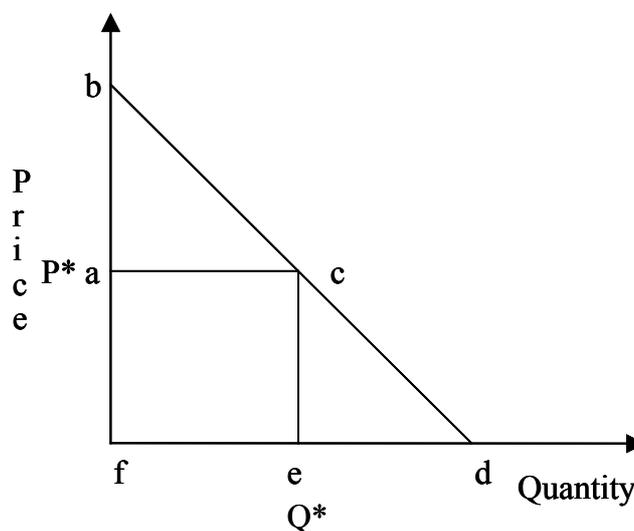


Figure B.1 shows that if we know the shape of the demand curve for alcohol, it is fairly simple to compute consumer surplus. In reality the demand curve is unlikely to be linear and estimating its shape is not simple for many reasons (for example, people might not know their willingness to pay) and the scope of this study does not allow us to estimate in any case. In the absence of such information we assume a linear demand curve. Estimates of the slope of this demand curve is made using estimates of 'elasticity of demand' of different alcohol products from literature and the following formula:

Elasticity of demand,  $\eta_D = \% \text{ change in quantity demanded} / \% \text{ change in price}$

$$\eta_D = 1/\text{Slope of the demand curve} * P/Q$$

$$\text{Slope of the demand curve} = 1/\eta_D * P/Q$$

Elasticity of demand is used to estimate the change in revenue for a change in price. For example, an elasticity of -1 shows that a change in price of a good by 10% would be offset by a 10% decrease in quantity demanded - leaving revenue unchanged.

In Section 2.2 we estimate the total price and quantity of alcohol consumed for beer, cider, wines and spirits in London. Estimates of own price elasticity of demand of these drink types is taken from Blake and Nied's (1995) analysis of demand for alcoholic drinks in United Kingdom. The results are summarised in Table B.1.

**Table B.1**  
**Estimate of Consumer Surplus**

	<b>Beer</b>	<b>Cider</b>	<b>Wine</b>	<b>Spirits</b>	<b>Total</b>
Expenditure (£m)	2.26	0.20	1.23	0.94	4.62
Volume of consumption (m Litres)	730.25	77.31	165.34	11.94	
Price per Litre	3.09	2.55	7.43	76.35	
Elasticity	-0.95	-0.80	-1.32	-0.93	
<b>Consumer Surplus (£m)</b>	<b>1.12</b>	<b>0.10</b>	<b>0.61</b>	<b>0.47</b>	<b>2.31</b>

*Source: NERA estimate using Blake and Nied (1995).*

Table B.1 shows that the cider is the least elastic of all the drink types i.e. it has the highest elasticity at -0.8. A 10% increase in cider price only reduces the quantity by 8% - resulting in an increase in revenue. Conversely, wines are most elastic of the drink types being assessed. A 10% increase in price of wine results in a 13.2% decrease in demand, resulting in a drop in revenue. Using elasticity, price and quantity shown in the table we estimated the slope of the demand curve and hence the consumer surplus at the given average price. The results show that for all the drinks types the surplus is almost 50% of the price i.e. people are, on average, willing to pay an extra 50% more compared to the prevailing average price in the market.

Estimating consumer surplus in this manner is very simplistic. We know that the demand curve of a product like alcohol is not linear - hence the slope and elasticity vary for different quantities. A linear demand curve implies the same value to the first pint of beer compared to the 10th. However in real life people are likely to value the first pint much more than the 10th. On an aggregate level, this implies a change in the elasticity for different volume of consumption. In other words, if wine consumption in London was only 10% of what it is now, and prices were to go up by 10%, people might not drop there consumption by 13.2%, as would be implied by our present estimates.

Besides, the demand for alcohol is also likely to change with time and is expected to be different between the UK and London. Hence the estimates from Blake and Nied (1995) may not accurately reflect the present market in London. Therefore these estimates of consumer surplus should only be considered as indicative.

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