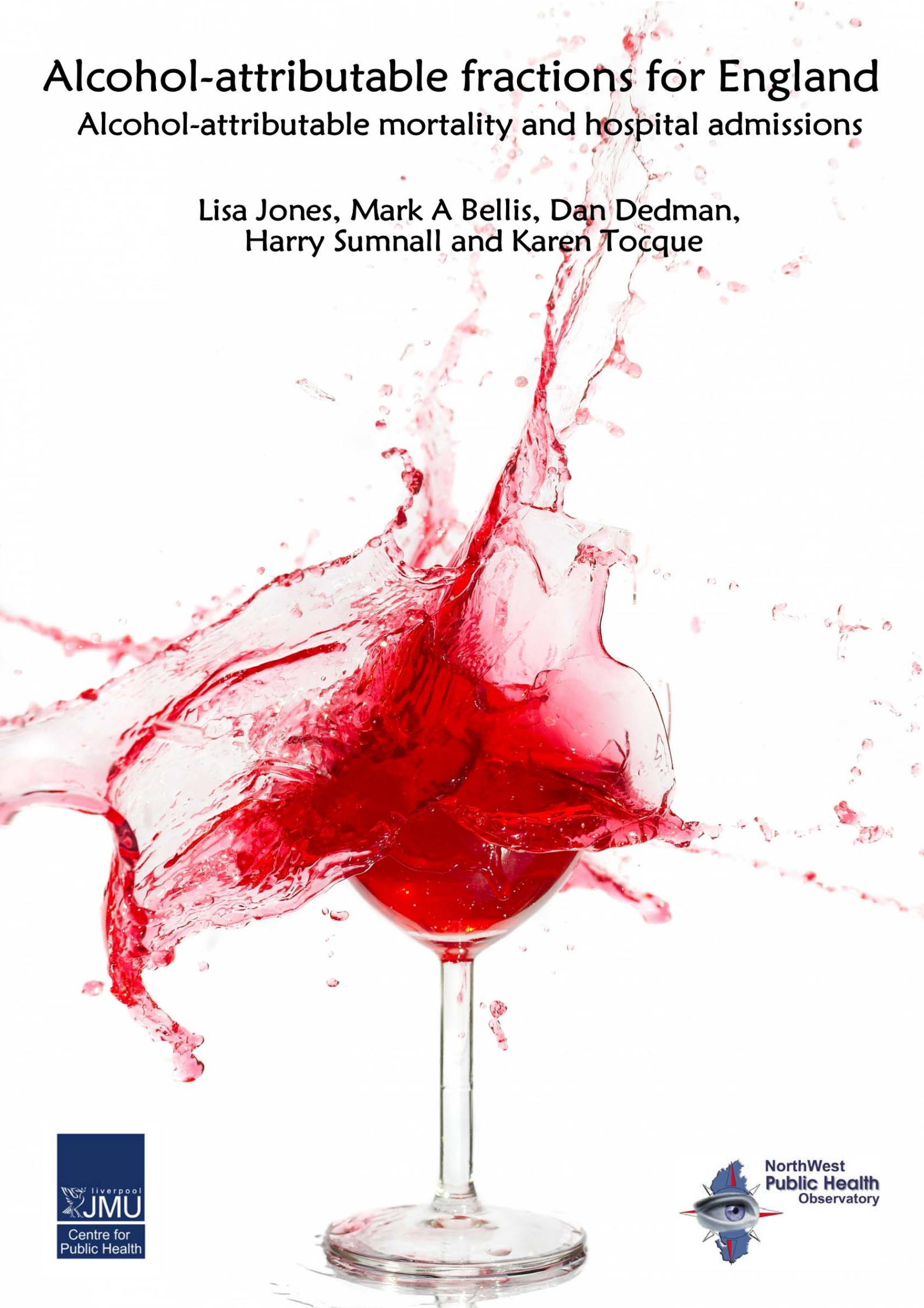
Alcohol-attributable fractions for England

Alcohol-attributable mortality and hospital admissions

Lisa Jones, Mark A Bellis, Dan Dedman,
Harry Sumnall and Karen Tocque



liverpool JMU
Centre for Public Health

NorthWest Public Health Observatory

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Abbreviations

AAF	Alcohol-attributable fraction
BAC	Blood alcohol concentration
GHS	General Household Survey
HES	Hospital Episode Statistics
HMRC	HM Revenue and Customs
IHD	Ischaemic heart disease
NWPHO	North West Public Health Observatory
ONS	Office for National Statistics
RR	Relative risk
WHO	World Health Organisation

Executive Summary

Studies have been undertaken in many countries, including the USA, Australia and Canada to determine the costs of alcohol to society and the World Health Organisation has estimated that alcohol consumption accounts for 4.0% of all disease burden worldwide, although this excludes many of the indirect effects of alcohol. In England, alcohol-attributable fractions (AAFs) are annually applied to Hospital Episode Statistics (HES) and mortality data by the North West Public Health Observatory (NWPHO) to provide an indication of the public health effects of alcohol. However, the existing AAFs do not take into account levels of alcohol consumption in England and since their calculation, further studies that examine the risks of alcohol consumption have been published. The purpose of this report was to calculate and present new AAFs specific to England. The calculation of AAFs was based on the most recent population estimates of alcohol consumption data in England and the best risk estimates extracted from the published literature.

In this study, AAFs were calculated for 47 conditions, of which 13 conditions were by definition wholly attributable to alcohol consumption and 34 conditions were partially attributable to alcohol consumption. Based on the AAFs calculated, 14,982 deaths were estimated to be attributable to alcohol consumption, representing 3.1% of all deaths in England in 2005. Men were more at risk of harm from their alcohol consumption than women; 4.4% of male deaths were alcohol attributable compared to 2.0% of female deaths. Alcohol-attributable deaths also varied by age, and although the highest number of deaths were seen in older age groups, young people were disproportionably affected by their alcohol use, for example, among 16-24 year old males, 26.6% of all deaths were estimated to be attributable to alcohol consumption compared to 1.4% among those aged 75 and over. In those aged less than 35 years, deaths were most likely to occur from the acute consequences of alcohol consumption, in particular, intentional self-harm and road traffic accidents. Beyond the age of 35, liver cirrhosis, malignant neoplasm of the oesophagus and breast, and hypertensive diseases were the most common causes of death attributable to alcohol. For the conditions where risk estimates were reported for different categories of alcohol consumption, it was possible to determine the number of deaths attributable to specific levels of alcohol consumption. For malignant neoplasm, hypertensive diseases, and acute and chronic pancreatitis, male deaths were evenly distributed across all four categories of alcohol consumption examined, whereas female deaths were found to be more attributable to lower levels of alcohol consumption (1-19 g/day). For ischaemic and haemorrhagic stroke, and unspecified liver cirrhosis the majority of deaths were attributable to alcohol consumption exceeding 40 g/day. These patterns largely occurred because of differences in the distribution of males and females across the different categories of alcohol consumption.

Applying the AAFs calculated to hospital admissions revealed that an estimated 459,842[1] people were admitted to hospital as a consequence of their alcohol consumption in 2005. The most common reasons for hospital admission in males and females were hypertensive diseases, mental and behavioural disorders due to use of alcohol, and cardiac arrhythmias. Mental and behavioural disorders due to use of alcohol, which included admissions for a wide variety of disorders relating to alcohol use, were the leading cause of alcohol-related admissions in males under the age of 55.

Currently, some epidemiological evidence supports a protective effect of low levels of alcohol consumption on the risk of ischaemic heart disease (IHD), but there has been much debate regarding the true extent of the protective effects of alcohol. Based on data from recent meta-analyses, alcohol consumption was found to have protective effects on the risk of four conditions: IHD; ischaemic stroke, type II diabetes; and cholelithiasis. Directly applying the AAFs, would suggest that 8,838 deaths may be prevented by alcohol consumption (based on data from 2005). However, the vast majority are from the prevention of IHD deaths among individuals aged over 75 years and studies that have examined how the risks of heart disease change with increasing age have found that, at least in men, there is no evidence for a protective effect of alcohol in those aged 75 and older. Therefore, excluding data on deaths from IHD in males and females aged over 75 years, the number of deaths prevented is estimated at 3,813 (0.8% of all deaths). Using the same methodology, the number of people requiring hospital admissions related to their alcohol consumption (n=459,842) far outweighed the number of people prevented from requiring hospital admission (n=34,528).

There are limitations to the methods used to calculate AAFs as these rely on the accuracy of population estimates of alcohol consumption and the quality of the relative risk estimates reported in the epidemiological literature. It is acknowledged that estimates based on self-report may underestimate true consumption in the general population and it was not possible to consistently apply age- or gender-specific relative risks across the conditions examined. In addition, although most studies have not examined the impact of drinking patterns, there is evidence that patterns of drinking, such as irregular heavy drinking, may increase the risk of some types of disease and injury. Current methodologies for AAFs do not reflect such limitations through the calculation of confidence intervals and we have not developed such methodologies here. However, such techniques are required to provide a quantitative measure of the uncertainty surrounding AAF. Despite these limitations, we have used the best risk estimates and most recent alcohol consumption data available to calculate AAFs specific to England. These calculations reveal that there are a significant proportion of avoidable deaths and hospital admissions attributable to alcohol consumption each year, particularly in young people. Given the limitations of the data (e.g. some conditions are not

[1] In this report we calculate the number of individuals admitted to hospital in England for alcohol related conditions. The national indicator for alcohol, NI 39, relates to the total number of alcohol related admissions for selected conditions.

covered by reliable studies and are therefore omitted), the figures presented are likely to be an underestimation of the harm attributable to alcohol consumption in England.

1 Introduction

Alcohol plays an important role in society, being consumed by the majority of adults and making an important contribution to the economy. However, the consumption of alcohol has both health and social consequences, and there is a direct dose-response relationship between alcohol consumption and risk of death (White et al., 2002). It is also well established that alcohol consumption contributes to traumatic outcomes through violence and injury.

The updated National Alcohol Strategy (Safe. Sensible. Social) aims to reduce the harms caused by alcohol by emphasising the promotion of sensible drinking. The government recommends that men should not regularly drink more than 3-4 units of alcohol per day and women should not regularly drink more than 2-3 units of alcohol per day (1 unit = 8g or 10ml alcohol). However, per capita alcohol consumption has increased over the last decade and recent estimates show that over 70% of adults in Britain drink alcohol, with 31% of men and 20% of women consuming in excess of 21 and 14 units on a weekly basis, respectively (Goddard, 2006). Around 25% of males and 15% of females may be classified as hazardous or harmful[2] alcohol users (Deacon et al., 2007). A key aim of government policy is to reduce the harm caused by drinking among three key groups; young people under 18 who drink alcohol, 18-24 year old binge drinkers and harmful drinkers[3].

Studies have been undertaken in many countries, including the USA, Australia and Canada to determine the costs of alcohol to society (e.g. Schultz et al., 1990; English et al., 1995; Single et al., 1996). In 2003, the World Health Organisation (WHO) undertook a study to estimate the global burden of disease attributable to alcohol (Rehm et al., 2003), finding that alcohol accounted for 4.0% of all disease burden worldwide (excluding many indirect health consequences). These studies have estimated the disease burden and acute consequences of alcohol consumption through the calculation of attributable (or aetiological) fractions. The attributable fraction may be defined as the proportion of disease risk in a population that would not have occurred if exposure to a risk factor or set of factors had not occurred. The alcohol-attributable fraction (AAF) is therefore calculated as a positive function of the prevalence of drinking (the exposure) and the relative risk function of each alcohol-related condition (the disease risk) to enable the estimation of the proportion of cases of a disease or type of injury that may be attributed to the consumption of alcohol.

Estimating alcohol attributable mortality and morbidity can be a useful indicator for developing national and local alcohol strategies (Britton and McPherson, 2001). Current AAFs for England are adapted from the International Guide for monitoring alcohol consumption and

[2] Hazardous drinkers are defined as those drinking above recognised sensible limits, but not yet experiencing harm. Harmful drinkers are defined as those drinking above recognised sensible levels and experiencing harm, such as an alcohol-related accident, acute alcohol poisoning, hypertension, or cirrhosis.

[3] Percentage of adults consuming hazardous and harmful levels of alcohol (22 or more units [males] or 15 or more units [women]).

related harm (2000) published by WHO. Previously, these AAFs have been applied to Hospital Episode Statistics (HES) and mortality data for England by the Cabinet Office/Strategy Unit (2003). Following this work they are currently used on an annual basis by the North West Public Health Observatory (NWPHO) to produce regional and local profiles of the public health effects of alcohol (Deacon et al., 2007) and are now included in three key indicator sets and performance management frameworks (NWPHO 2008). However, the existing AAFs do not take into account levels of alcohol consumption in England and since their calculation further studies that examine the risks of alcohol consumption have been published. The purpose of this report was to calculate and present new AAFs for England based on alcohol consumption data for England and the best risk estimates from recent meta-analyses and the epidemiological literature. The calculation of new AAFs allowed for the calculation of age- and sex-specific attributable fractions, and hence a more accurate means of estimating alcohol-attributable mortality and morbidity in England.

2 Methods

2.1 Alcohol attributable conditions

The Strategy Unit report (Cabinet Office/Strategy Unit, 2003) presented AAFs for 53 conditions, of which 11 were fully attributed to alcohol use and 42 where alcohol was believed to be a contributory factor (see Table 20 in Appendix 3). AAFs were adapted from the *International Guide for monitoring alcohol consumption and related harm* (2000) published by the World Health Organisation (WHO).

For this report, AAFs were calculated for conditions where there was sufficient evidence in the recent epidemiological literature of a causal relationship between alcohol consumption and the disease or injury. Some conditions included in the previous list were redefined for inclusion in this report or excluded altogether. Stroke, which was previously reported as a single AAF, was separated into whether the stroke was haemorrhagic or ischaemic in origin. Malignant neoplasm of the lip was included in the calculation of the AAF for other oral cancers and individual estimates for malignant neoplasm of the colon and rectum were calculated rather than a single AAF for "malignant neoplasm of other digestive organs". Finally, a single AAF was calculated for acute and chronic pancreatitis. Four conditions were excluded. Malignant neoplasm of the stomach, tuberculosis, and pneumonia and influenza were excluded because of a lack of epidemiological evidence on their association with alcohol consumption. Gastric and duodenal ulcer was also excluded based on evidence from Corrao et al. (2004) who found no clear relationship between alcohol consumption and this condition.

2.2 Estimating alcohol-attributable fractions

The AAF is a positive function of the prevalence of drinking and the relative risk function of each alcohol-related condition, and its calculation enables the estimation of the proportion of cases of a disease or type of injury that may be attributed to the consumption of alcohol. AAFs were calculated with abstention as the reference category in order to determine both the risks and the benefits of alcohol consumption at all levels of consumption. AAFs for chronic disease were calculated using pooled estimates of the effect of alcohol consumption extracted from the published literature (Corrao et al., 2004; Gutjahr et al., 2001; Rehm et al., 2004; Ridolfo & Stevenson, 2001). Risk estimates were primarily extracted from the work undertaken by Corrao et al. (1999; 2002; 2004) as these estimates were based on a comprehensive and systematic review of the epidemiological literature. Using these methods allowed for the calculation of AAFs using the most recent data on alcohol consumption in England and the most up-to-date and reliable risk estimates available. For external causes of morbidity and mortality, relative risk estimates were not available and AAFs were directly extracted from the literature (Ridolfo & Stevenson, 2001; Single et al., 1996; English et al., 1995). Table 1 shows the conditions for which AAFs were calculated, with their accompanying ICD 10 code, and the source of the relative risk estimates or AAFs used. Table 2 shows the relative risk estimates extracted from the literature.

Table 1. Source of relative risk estimates and AAFs

	Condition	ICD10 code(s)	Source(s)
Wholly attributable conditions	Alcohol-induced pseudo-Cushing's syndrome	E24.4	By definition these conditions are wholly attributable to alcohol consumption
	Mental and behavioural disorders due to use of alcohol	F10	
	Degeneration of nervous system due to alcohol	G31.2	
	Alcoholic polyneuropathy	G62.1	
	Alcoholic myopathy	G72.1	
	Alcoholic cardiomyopathy	I42.6	
	Alcoholic gastritis	K29.2	
	Alcoholic liver disease	K70	
	Chronic pancreatitis (alcohol induced)	K86.0	
	Ethanol poisoning	T51.0	
	Methanol poisoning	T51.1	
	Toxic effect of alcohol, unspecified	T51.9	
	Accidental poisoning by and exposure to alcohol	X45	
Partly attributable - chronic conditions	Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	Corrao et al., 2004
	Malignant neoplasm of oesophagus	C15	Corrao et al., 2004
	Malignant neoplasm of colon	C18	Corrao et al., 2004
	Malignant neoplasm of rectum	C20	Corrao et al., 2004
	Malignant neoplasm of liver and intrahepatic bile ducts	C22	Corrao et al., 2004
	Malignant neoplasm of larynx	C32	Corrao et al., 2004
	Malignant neoplasm of breast	C50	Hamajima et al., 2002
	Diabetes mellitus (type II)	E11	Gutjahr et al., 2001
	Epilepsy and Status epilepticus	G40-G41	Rehm et al., 2004
	Hypertensive diseases	I10-I15	Corrao et al., 2004
	Ischaemic heart disease	I20-I25	Corrao et al., 2004
	Cardiac arrhythmias	I47-I48	Gutjahr et al., 2001
	Heart failure	I50-I51	Single et al., 1996
	Haemorrhagic stroke	I60-I62, I69.0-I69.2	Corrao et al., 2004
	Ischaemic stroke	I63-I66, I69.3-I69.4	Corrao et al., 2004
	Oesophageal varices	I85	Corrao et al., 2004
	Gastro-oesophageal laceration-haemorrhage syndrome	K22.6	English et al., 1995
	Unspecified liver disease	K73, K74	Corrao et al., 2004
	Cholelithiasis	K80	Gutjahr et al., 2001
	Acute and chronic pancreatitis	K85, K86.1	Corrao et al., 2004
	Psoriasis	L40 excluding L40.5	Gutjahr et al., 2001
	Spontaneous abortion	O03	Gutjahr et al., 2001
Partly Attributable- acute consequences	Road traffic accidents – non-pedestrian	§	Ridolfo & Stevenson 2001
	Pedestrian traffic accidents	§§	Ridolfo & Stevenson 2001
	Water transport accidents	V90-V94	Single et al., 1996
	Air/space transport accidents	V95-V97	Single et al., 1996
	Fall injuries	W00-W19	Ridolfo & Stevenson 2001
	Work/machine injuries	W24-W31	English et al., 1995
	Firearm injuries	W32-W34	Single et al., 1996
	Drowning	W65-W74	English et al., 1995
	Inhalation of gastric contents/Inhalation and ingestion of food causing obstruction of the respiratory tract	W78, W79	Single et al., 1996
	Fire injuries	X00-X09	Single et al., 1996
	Accidental excessive cold	X31	Single et al., 1996
	Intentional self-harm/Event of undetermined intent	X60-X84, Y10-Y34	English et al., 1995
	Assault	X85-Y09	Single et al., 1996

NB: English *et al*'s (1995) AAFs are estimated based on the risk of medium/high risk consumption versus low risk consumption.
§ V12-V14 (.3 -.9), V19.4-V19.6, V19.9, V20-V28 (.3 -.9), V29-V79 (.4 -.9), V80.3-V80.5, V81.1, V82.1, V82.9, V83-V86 (.0 -.3), V87.0-V87.9, V89.2, V89.3, V89.9
§§ V02-V04 (.1, .9), V06.1, V09.2, V09.3

Table 2. Relative risk estimates for partly attributable chronic conditions

Condition	ICD10 code(s)	Relative risk estimate (g/day)								Source
		Males				Females				
		1-19	20-39	40-74	75+	1-19	20-39	40-74	75+	
Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	1.43	1.86	3.11	6.45	1.43	1.86	3.11	6.45	Corrao et al., 2004
Malignant neoplasm of oesophagus	C15	1.20	1.39	1.93	3.59	1.20	1.39	1.93	3.59	Corrao et al., 2004
Malignant neoplasm of colon	C18	1.03	1.05	1.10	1.21	1.03	1.05	1.10	1.21	Corrao et al., 2004
Malignant neoplasm of rectum	C20	1.05	1.09	1.19	1.42	1.05	1.09	1.19	1.42	Corrao et al., 2004
Malignant neoplasm of liver and intrahepatic bile ducts	C22	1.10	1.19	1.4	1.81	1.10	1.19	1.4	1.81	Corrao et al., 2004
Malignant neoplasm of larynx	C32	1.22	1.43	2.02	3.86	1.22	1.43	2.02	3.86	Corrao et al., 2004
Malignant neoplasm of breast	C50	-	-	-	-	1.07	1.21	1.35	1.46	Hamajima et al., 2002
Diabetes mellitus (type II)	E11	-	0.99[a]	0.57	0.73	0.92	0.87	1.13[b]	-	Gutjahr et al., 2001
Epilepsy and Status epilepticus	G40-G41	-	1.23[a]	7.52	6.83	1.34	7.22	7.52[b]	-	Rehm et al., 2004
Hypertensive diseases	I10-I15	1.15	1.43	2.04	4.15	1.15	1.43	2.04	4.15	Corrao et al., 2004
Ischaemic heart disease	I20-I25	0.82	0.85	0.98	1.53	0.85	0.90	1.10	1.87	Corrao et al., 2004
Cardiac arrhythmias	I47-I48	-	1.51	2.23	2.23	1.51	2.23	2.23	-	Gutjahr et al., 2001
Haemorrhagic stroke	I60-I62, I69.0-I69.2	1.10	1.19	1.82	4.7	1.10	1.19	1.82	4.7	Corrao et al., 2004
Ischaemic stroke	I63-I66, I69.3-I69.4	0.85	0.9	1.17	4.37	0.85	0.9	1.17	4.37	Corrao et al., 2004
Oesophageal varices	I85	1.95	2.9	7.13	26.53	1.95	2.9	7.13	26.53	Corrao et al., 2004
Unspecified liver disease	K73, K74	1.95	2.9	7.13	26.53	1.95	2.9	7.13	26.53	Corrao et al., 2004
Cholelithiasis	K80	-	0.82[a]	0.68	0.5	0.82	0.68	0.5[b]	-	Gutjahr et al., 2001
Acute and chronic pancreatitis	K85, K86.1	1.12	1.34	1.78	3.19	1.12	1.34	1.78	3.19	Corrao et al., 2004
Psoriasis	L40 excluding L40.5	-	1.58[a]	1.6	2.2	1.58	1.6	2.2[b]	-	Gutjahr et al., 2001
Spontaneous abortion	O03	-	-	-	-	1.2	1.76	1.79[b]	-	Gutjahr et al., 2001

[a]1-30 g/day; [b]40+ g/day

AAFs were calculated across five categories of alcohol consumption: abstention, 1 to 19 g/day, 20 to 39 g/day, 40 to 74 g/day and 75 or more g/day. These categories of alcohol consumption were chosen as they corresponded with the risk estimates in the existing literature (e.g. 25, 50 and 100 g/day presented by Corrao et al. 2004). For estimating effects in the 1 to 19 g/day category we used one of two methods. For conditions where there was evidence of a J-shaped relationship (e.g. IHD, ischaemic stroke), we used risk functions reported by Corrao and colleagues in earlier meta-analyses (Corrao et al., 1999, Corrao et al., 2002). For all other conditions we followed the methods of Boffetta et al. (2006), who estimated the excess risk in the 1 to 19 g/day category to be half of that reported for 25 g/day. For the other categories we used the original RR estimates presented; 25 g/day was used for the 20 to 39 g/day category, 50 g/day for the 40 to 74 g/day (40 or more g/day for females), and 100 g/day for 75 or more g/day. For risk estimates extracted from other sources (e.g. Rehm et al., 2004; Gutjahr et al., 2001) the first and last two categories were combined for males and females, respectively, as risk estimates were presented for three different drinking categories only[4].

The age-specific distribution of alcohol consumption for adults aged 16-74 years old in England was determined from the General Household Survey (GHS) 2005 and is shown in Table 3. The GHS was selected because it is the only current source of population estimates of drinking that allowed for the calculation of units consumed per week. One unit of alcohol was assumed to be equal to 8 g of alcohol. The figures from the 2005 survey were uplifted to correct for the increase in alcohol content by updating estimates of average alcoholic strength for wine and beer (see www.statistics.gov.uk/statbase/product.asp?vlnk=15067). The methods used to calculate the age-specific distribution of alcohol consumption are shown in Appendix 1.

Table 3. Age-specific distribution of alcohol consumption (uplifted)

Age	Males (g/day)					Females (g/day)				
	None	1 - 19	20-39	40 - 74	75+	None	1 - 19	20 - 39	40-74	75+
16 to 24	18.1%	43.5%	20.5%	9.9%	7.9%	23.8%	51.3%	16.2%	5.2%	3.5%
25 to 34	17.8%	42.0%	20.7%	13.2%	6.3%	23.9%	56.2%	13.7%	4.8%	1.4%
35 to 44	12.4%	45.6%	22.9%	14.7%	4.5%	23.1%	55.3%	15.1%	4.9%	1.5%
45 to 54	12.4%	42.7%	22.0%	14.5%	8.4%	25.5%	52.9%	14.3%	6.1%	1.2%
55 to 64	13.9%	44.8%	19.4%	16.0%	5.9%	30.3%	51.3%	12.2%	5.2%	1.1%
65 to 74	20.0%	49.2%	16.7%	9.9%	4.1%	43.5%	46.2%	7.8%	1.7%	0.9%
75 +	28.5%	49.6%	12.9%	7.5%	1.5%	52.3%	41.4%	4.8%	1.2%	0.2%
16-75	16.5%	45.0%	19.9%	12.9%	5.7%	30.2%	51.5%	12.5%	4.4%	1.4%

Source: NWPHO from the General Household Survey 2005

[4] Average volume drinking category I (for females 0–19 g/day; for males 0–39 g/day); average volume drinking category II (for females 20–39 g/day; for males 40–59 g/day); and average volume drinking category III (for females 40 g or more g/day; for males 60 g or more g/day).

AAFs were calculated for multiple levels of alcohol consumption using the following formula (a worked example is given in Box 1):

$$AAF = \frac{\sum_{i=1}^{k} p_i (RR_i - 1)}{\sum_{i=0}^{k} p_i (RR_i - 1) + 1}$$

where RR_1 = relative risk of mortality in exposed groups compared with unexposed groups

p_i = proportion of the population exposed in each group

i = 0 to k, where i=0 represent nondrinkers.

Box 1. A worked example

The worked example below shows the calculation of the AAF for malignant neoplasm of the lip, oral cavity and pharynx in males aged 16 to 24 where (as shown in Table 2) 18.1% are abstainers, 43.5% drink between 1 and 19 g/day, 20.5% drink between 20 and 39 g/day, 9.9% drink between 40 and 74 g/day and 7.9% drink more than 75 g/day. Using abstainers as the reference groups (RR=1.00), the RR estimates for malignant neoplasm of the lip, oral cavity and pharynx are: 1.43 for drinking 1-19 g/day; 1.86 for drinking 20-39 g/day; 3.11 for drinking 40-74 g/day and 6.45 for drinking more than 75 g/day.

Applying the formula above gives the following estimates of the AAF for malignant neoplasm of the lip, oral cavity and pharynx in males aged 16 to 24.

Malignant neoplasm of the lip, oral cavity and pharynx AAF for males aged 16-24 drinking between 1 and 19 g/day:

$$=(0.435\,(1.43-1))/1+(0.181\cdot(1.00-1))+(0.435\,(1.43-1))+(0.205\,(1.86-1))+(0.099\cdot(3.11-1))+(0.079\cdot(6.45-1))$$
$$=9.3\%$$

Malignant neoplasm of the lip, oral cavity and pharynx AAF for males aged 16-24 drinking between 20 and 39 g/day:

$$=(0.205\,(1.86-1))/1+(0.181\cdot(1.00-1))+(0.435\,(1.43-1))+(0.205\,(1.86-1))+(0.099\cdot(3.11-1))+(0.079\cdot(6.45-1))$$
$$=8.8\%$$

Malignant neoplasm of the lip, oral cavity and pharynx AAF for males aged 16-24 drinking between 40 and 74 g/day:

$$=(0.099\,(3.11-1))/1+(0.181\,(1.00-1))+(0.435\,(1.43-1))+(0.205\,(1.86-1))++(0.099\,(3.11-1))+(0.079\,(6.45-1))$$
$$=10.4\%$$

Malignant neoplasm of the lip, oral cavity and pharynx AAF for males aged 16-24 drinking more than 75 g/day:

$$=(0.079\,(6.45-1))/1+(0.181\cdot(1.00-1))+(0.435\,(1.43-1))+(0.205\,(1.86-1))++(0.099\,(3.11-1))+(0.079\,(6.45-1))$$
$$=21.5\%$$

The overall AAF for malignant neoplasm of the lip, oral cavity and pharynx in males aged 16 to 24 $=(9.3+8.8+10.4+21.5)=50.1\%$

The number of deaths and hospital admissions attributable to alcohol consumption were determined by multiplying the AAF for each age group by the total number of deaths and

hospital admissions for each condition and age group. Mortality data for England in 2005 was obtained from NWPHO from the Office for National Statistics (ONS) mortality extracts. Further, here we have used AAFs to calculate person-specific hospital admissions[5] rather than the total number of hospital admissions (as utilised in national indicator for alcohol, NI 39). Person-specific admissions were originally adopted by the NWPHO LAPE tool as one measure of the number of individuals' being adversely affected by alcohol. However, the national indicator was subsequently developed as a measure of pressures from alcohol on health systems. Consequently, for the national indicator, the AAFs calculated here have been applied to number of admissions rather than number of persons. To calculate the number of person-specific hospital admissions attributable to alcohol consumption, person-specific data on relevant conditions were obtained from NWPHO from Hospital Episode Statistics (HES) for 2005/06. These data are presented in Tables 15 and 16 in Appendix 2.

2.3 Limitations

There are limitations to the methods used to calculate AAFs. The calculation is a function of relative risk estimates and population drinking estimates, and therefore relies on the accuracy of population estimates of alcohol consumption and the availability and quality of the relative risk estimates reported in the epidemiological literature. There is, therefore, a degree of uncertainty surrounding the estimated presented, but as with other calculations of AAFs (e.g. Rehm et al., 2006; Ridolfo & Stevenson, 2001) we have not developed methodologies for calculating confidence intervals for each AAF. However, we acknowledge that there is a need to develop such methodologies, which provide a quantitative measure of the uncertainty surrounding the AAF estimates presented.

A further limitation of the methods used concerns the application of AAFs to hospital admissions, as this requires the assumption that the admission profile for an alcohol-related admission for a partially attributable condition is the same as the admission profile for a non-alcohol-related admission.

[5] The person based analysis provides an estimate of period prevalence, i.e. the population risk of being admitted to hospital at least once during the course of a (financial) year. Episodes relating to the same individual were were linked using HESID. An individual may have more than one alcohol related episode, and within an episode, more than one alcohol related diagnosis. To avoid double counting, an individual was assigned only one alcohol related diagnosis as follows: (1) for each individual, identify all alcohol related diagnosis codes from their HES records; (2) select the code(s) with the largest attributable fraction; (3) in the event of there being two or more episodes with the same high attributable fraction, select the one from the earliest episode (using episode start date); and (4) in the event of there being two or more diagnosis with the same high attributable fraction, within the same episode, select the one from the lowest diagnostic position.

3 Harmful effects of alcohol consumption

3.1 Conditions wholly attributable to alcohol consumption

A number of diseases, by definition are wholly attributable to alcohol consumption. These conditions and their ICD-10 codes are listed below:

- Alcohol-induced pseudo-Cushing's syndrome (E24.4)
- Mental and behavioural disorders due to use of alcohol (F10; combines ICD 9 codes for alcoholic psychosis, alcohol dependence and alcohol abuse)
- Degeneration of nervous system due to alcohol (G31.2)
- Alcoholic polyneuropathy (G62.1)
- Alcoholic myopathy (G72.1)
- Alcoholic cardiomyopathy (I42.6)
- Alcoholic gastritis (K29.2)
- Alcoholic liver disease (K70)
- Chronic pancreatitis (alcohol induced) (K86.0)
- Ethanol/methanol poisoning (T51.0, T51.1)
- Toxic effect of alcohol, unspecified (T51.9)
- Accidental poisoning by and exposure to alcohol (X45)

3.2 Chronic conditions attributable to alcohol consumption

3.2.1 Malignant neoplasms

Corrao et al. (2004) found consistent and significant effects of alcohol consumption on cancers of the oral cavity and pharynx, oesophagus, larynx, colon, liver and breast. Risk estimates for breast cancer were drawn from a meta-analysis by Hamajima et al. (2002), which was based on individual patient data (i.e. raw data rather than summary estimates were pooled). Rehm et al. (2004) reported that the evidence for a causal relationship between alcohol and cancers of the stomach, pancreas, rectum, and prostate is weak and inconclusive. However, Corrao et al. (2004) have reported a direct relationship between alcohol consumption and malignant neoplasm of the rectum so an AAF is presented for this condition. There is limited or conflicting evidence for cancers of the salivary glands, ovary, endometrium and bladder (Rehm et al., 2004) so AAFs are not presented for these conditions.

3.2.2 Diseases of the nervous system

Alcohol use has been found to be a powerful risk factor for a first seizure in adults of both sexes (Leone et al., 2002) with a dose-response effect evident for idiopathic/cryptogenic

seizures. However, Leone et al. (2002) found no evidence of an association between alcohol use and the risk of symptomatic seizures[6]. Corrao et al. (2004) did not calculate a risk estimate for epilepsy and so RR estimates were extracted from the meta-analysis by Gutjahr et al. (2001).

3.2.3 Diseases of the circulatory system

The effects of alcohol on cardiovascular disease have been extensively studied. In particular, studies have focused on the protective effects of alcohol on ischaemic heart disease (IHD). However, there is also evidence that alcohol can have detrimental effects on diseases of the circulatory system. Alcohol consumption increases the risk of cardiac arrhythmias (Gutjahr et al., 2001) and essential hypertension (Corrao et al., 2004), with significant effects observed at levels corresponding to daily consumption of 25 g/day.

Stroke: There is consistent evidence of an increased risk of haemorrhagic stroke associated with alcohol consumption, however, the effects of alcohol consumption on ischaemic stroke are less clear (Corrao et al., 1999; 2002). Corrao et al. (2004) reported significant increased risks of ischaemic stroke at consumption above 100 g/day, but that a non-significant protective effect of alcohol against ischaemic stroke was apparent at low levels of consumption. The protective effects of alcohol consumption on ischaemic stroke are covered in Section 4.

Routine classification of deaths from stroke is unreliable, and more than half of the death certificates for deaths from cerebrovascular diseases in England and Wales do not specify whether the stroke was ischaemic or haemorrhagic (personal communication, ONS). As the majority of strokes are ischaemic in origin (approximately 85%; Bamford et al., 1990), unspecified strokes (ICD 10 code: I64) were included as ischaemic.

Heart failure: Rehm et al. (2004) reported that heart failure and ill-defined complications of heart disease is an unspecific category with no identification of underlying pathology, and that therefore the relationship between average volume of consumption cannot be determined by meta-analysis. We extracted the AAF for this condition from Single et al. (1996).

Oesophageal varices: The most common underlying cause of oesophageal varices is liver cirrhosis (English et al., 1995) and so the overall unspecified liver cirrhosis RR estimates extracted from Corrao et al. (2004) were applied for this condition.

3.2.4 Diseases of the digestive system

Liver disease: Alcohol consumption is the leading cause of liver cirrhosis and we included cases of alcoholic liver disease (ICD 10 code: K70) under conditions wholly attributable to alcohol. However, bias exists in ascribing deaths to alcoholic liver disease, largely due to

[6] Seizures considered the consequence of a known or suspected cerebral dysfunction such as head injury, cerebrovascular accident, brain tumour, and others.

under recording on death certificates (e.g. Bell & Cremona, 1987; Blake et al., 1988). For example, a study that examined mortality from liver disease in the West Midlands found that alcohol misuse was the presumed cause in 67% of cases recorded as “unspecified” liver disease (Fisher et al., 2002). Corrao et al. (2004) reported a single risk estimate for liver cirrhosis (including cases of alcoholic liver disease, and fibrosis and cirrhosis of the liver) and we applied this risk estimate to “unspecified” cases of liver disease (ICD 10 code: K73 and K74).

Acute and chronic pancreatitis: Corrao et al. (2004) also found strong direct trends in risk for chronic pancreatitis and alcohol consumption. Risk estimates were not presented for acute pancreatitis but some researchers have argued that discrimination between cases of chronic and acute pancreatitis is not justified (e.g. Amman et al., 1996) and we have followed these methods by presenting a single AAF for acute and chronic pancreatitis.

3.2.5 Other chronic conditions

Psoriasis: Alcohol intake has been found to be a risk factor for psoriasis in young and middle aged men (Poikolainen et al., 1990) and there is some evidence that alcohol intake worsens the symptoms of psoriasis in women (Poikolainen et al., 1994). The AAF for psoriasis was based on RR estimates extracted from the meta-analysis by Gutjahr et al. (2001). They reported estimates based on the meta-analysis by English et al. (1995), concluding that the pooled estimates showed a consistently strong and statistically significant relationship between alcohol consumption and psoriasis.

3.3 Acute consequences of alcohol consumption

A number of acute consequences of alcohol consumption have been identified in the literature. However, there is no general consensus regarding AAFs for these outcomes and the risks of injury are likely to be linked to the average volume of alcohol consumption and to patterns of drinking, especially heavy drinking occasions with intoxication (Rehm et al., 2003).

Estimates of AAFs for acute consequences related to alcohol consumption have been made using a simple ‘direct method’. English et al. (1995) and Single et al. (1996) have estimated AAFs for injuries such as road crash and drowning by pooling data from case series studies which have systematically investigated the proportions of such cases known to involve alcohol. Corrao et al. (2004), however, used a different approach due to the difficulty in estimating the dose-response relationship for each condition. They estimated a single risk estimate for injuries and other acute consequences of alcohol consumption. In order to calculate separate AAFs for the acute consequences of alcohol consumption we have extracted AAFs directly from the work of English et al. (1995) and Single et al. (1996), with the exception of road accidents and fall injuries. AAFs for these two conditions were extracted from the work of Ridolfo and Stevenson (2001).

3.3.1 Road accidents

AAFs for road accidents were extracted from Ridolfo and Stevenson (2001) as these were the most up-to-date estimates available. They derived an overall AAF for motor vehicle driver and motorcycle rider road accident deaths caused by driving or riding with a blood alcohol concentration (BAC) >50mg/100ml of 0.33 for males and 0.11 for females. For pedestrian deaths caused by driving with a BAC >100mg/100ml, AAFs were estimated at 0.40 for males and 0.17 for females.

3.3.2 Fall injuries

AAFs for fall injuries were extracted from the work of Ridolfo and Stevenson (2001). Based on hazardous/harmful alcohol consumption compared to low alcohol consumption, Ridolfo and Stevenson (2001) determined separate AAFs for fall injuries for males and females aged less than 65 years and 65 years or more They found that among people aged less than 65 years, 22% of male falls and 14% of female falls were attributable to alcohol, compared to 12% and 4% of falls among male and females aged over 65 years, respectively.

3.3.3 Other external causes of morbidity and mortality

No recent studies had examined the association between alcohol consumption and the following external causes of morbidity and mortality, and therefore estimates of the AAF were extracted directly from the work of Single et al. (1996) and English et al. (1995):

- Water transport accidents
- Air/space transport accidents
- Work/machine injuries
- Firearm injuries
- Drowning
- Inhalation and ingestion of gastric contents
- Fire injuries
- Accidental excessive cold
- Assault

3.4 Alcohol-attributable mortality

Detailed tables showing the calculated AAFs for each condition, number of deaths in 2005 and person-specific hospital admissions in 2005 are presented in Appendix 2.

Overall, in 2005, an estimated 14,982 deaths were attributable to alcohol consumption (3.1% of all deaths); 4,699 deaths occurred from conditions wholly attributable to alcohol consumption, and of the deaths partially attributable to alcohol consumption, 6,023 were from

chronic conditions and 2,922 were from the acute consequences. Table 4 provides an estimate of the number of alcohol-attributable deaths by alcohol consumption by age and sex.

Table 4. Number (% of all deaths in each age group) of alcohol-attributable deaths

Age	Males		Females		Total	
	n	%	n	%	n	%
16-24	438	26.6%	107	14.7%	546	22.9%
25-34	607	22.5%	200	15.0%	808	20.0%
35-44	1,241	21.6%	514	14.7%	1,756	19.0%
45-54	1,972	17.4%	896	11.7%	2,869	15.1%
55-64	2,254	8.9%	947	5.7%	3,202	7.6%
65-74	1,727	3.6%	719	2.1%	2,446	3.0%
75+	1,790	1.4%	1,566	0.8%	3,357	1.1%
All ages	10,031	4.4%	4,951	2.0%	14,982	3.1%

Data from 2005

Men were more affected by their alcohol consumption than women; 4.4% of male deaths were alcohol attributable compared to 2.0% of female deaths. This difference arises because males have higher levels of alcohol consumption, and does not reflect differences in relative risks between genders as for the vast majority of conditions, gender-specific RR estimates were not available for the calculation of AAFs. Alcohol-attributable deaths also varied by age, and although the highest number of deaths were seen in older age groups, as shown in Table 4, young people were disproportionably affected by their alcohol use. For example, among 16-24 year old males, 26.6% of all deaths were estimated to be attributable to alcohol consumption compared to 1.4% among those aged 75 and over.

3.4.1 Causes of death

Overall, the largest number of alcohol-related deaths were from alcoholic liver disease (n=3,874), intentional self harm/event of undetermined intent (n=1,694) and malignant neoplasm of the oesophagus (n=1,280). As shown in Figures 1 and 2, among younger age groups (<34 years) the majority of deaths occurred from the acute consequences of alcohol consumption, in particular, intentional self-harm and road traffic accidents. Beyond the age of 35, the highest number of deaths occurred from chronic conditions partially attributable to alcohol consumption. In these age groups, alcoholic liver disease, malignant neoplasm of the oesophagus and breast, and hypertensive disease were the most common causes of death attributable to alcohol. The top three causes of death by age and sex are shown in Table 5.

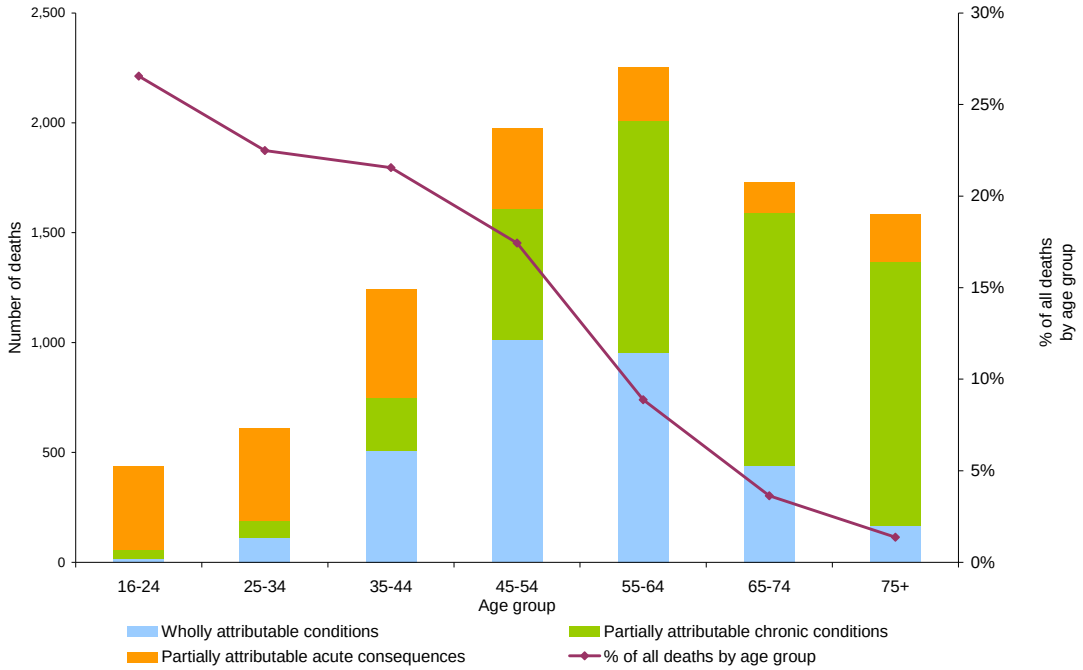

Figure 1. Number (% of all deaths in each age group) of male deaths attributable to alcohol consumption by age and type of condition (2005)

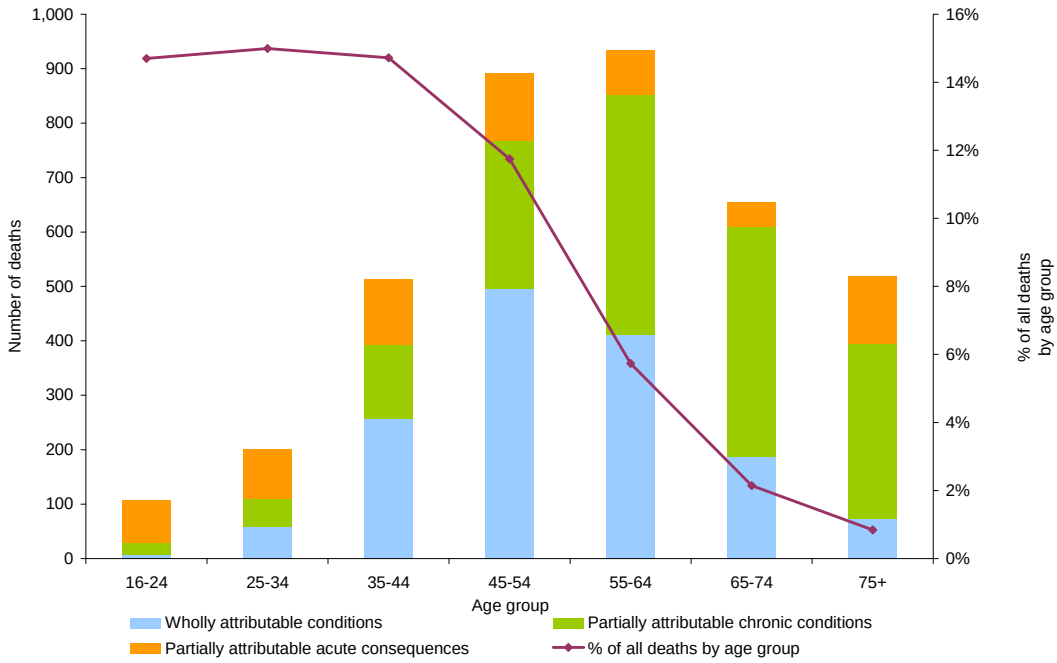

Figure 2. Number (% of all deaths in each age group) of female deaths attributable to alcohol consumption by age and type of condition (2005)

Table 5. Top three causes of alcohol-attributable deaths by age and sex

Age	Males		Females	
	Condition	**n**	**Condition**	**n**
16-24	Road traffic accidents - non pedestrian	185	Intentional self-harm	48
	Intentional self-harm	142	Road traffic accidents - non pedestrian	19
	Pedestrian traffic accidents	34	Epilepsy and Status epilepticus	18
25-34	Intentional self-harm	249	Intentional self-harm	71
	Road traffic accidents - non pedestrian	126	Alcoholic liver disease	41
	Alcoholic liver disease	61	Epilepsy and Status epilepticus	33
35-44	Alcoholic liver disease	382	Alcoholic liver disease	208
	Intentional self-harm	323	Intentional self-harm	95
	Road traffic accidents - non pedestrian	113	Malignant neoplasm of breast	48
45-54	Alcoholic liver disease	827	Alcoholic liver disease	427
	Intentional self-harm	251	Malignant neoplasm of breast	99
	Unspecified liver cirrhosis	131	Intentional self-harm	89
55-64	Alcoholic liver disease	802	Alcoholic liver disease	362
	Malignant neoplasm of oesophagus	278	Malignant neoplasm of breast	154
	Unspecified liver cirrhosis	178	Unspecified liver cirrhosis	69
65-74	Alcoholic liver disease	388	Alcoholic liver disease	167
	Malignant neoplasm of oesophagus	295	Malignant neoplasm of breast	109
	Haemorrhagic stroke	158	Unspecified liver cirrhosis	90
75+	Malignant neoplasm of oesophagus	339	Cardiac arrhythmias	396
	Cardiac arrhythmias	212	Malignant neoplasm of breast	194
	Haemorrhagic stroke	207	Hypertensive diseases	153

Data from 2005

3.4.2 Mortality attributable to different levels of alcohol consumption

For conditions where risk estimates were extracted from Corrao et al. (2004), as described in Box 1, the overall AAF is the sum of AAFs calculated across four different levels of alcohol consumption: 1-19 g/day; 20-39 g/day; 40-74 g/day; and 75+ g/day. For these conditions it was therefore possible to determine the number of deaths attributable to specific levels of alcohol consumption as shown in Table 6 for male deaths and Table 7 for female deaths.

Table 6. Number of male deaths (%) attributable to different levels of alcohol consumption

Condition	Alcohol consumption (g/day)							
	1-19		20-39		40-74		75+	
Malignant neoplasm								
Lip, oral cavity and pharynx	109	11.0%	80	8.1%	132	13.3%	129	13.0%
Oesophagus	278	7.0%	184	4.6%	286	7.2%	273	6.9%
Colon	50	1.2%	32	0.8%	40	0.9%	27	0.6%
Rectum	12	2.0%	8	1.3%	11	1.8%	9	1.5%
Liver	54	4.0%	36	2.6%	49	3.6%	35	2.6%
Larynx	36	7.5%	24	5.0%	37	7.7%	37	7.7%
Other conditions								
Hypertensive diseases	81	5.6%	71	4.9%	107	7.4%	101	7.0%
Ischaemic stroke	-811	-7.4%	-153	-1.4%	156	1.4%	805	7.3%
Haemorrhagic stroke	105	3.5%	71	2.4%	196	6.6%	306	10.2%
Unspecified liver cirrhosis	112	12.5%	83	9.2%	177	19.7%	277	30.8%
Acute and chronic pancreatitis	20	4.5%	19	4.3%	28	6.4%	28	6.4%

Data from 2005

Table 7. Number of female deaths (%) attributable to different levels of alcohol consumption

Condition	Alcohol consumption (g/day)							
	1-19		20-39		40-74		75+	
Malignant neoplasm								
Lip, oral cavity and pharynx	75	14.5%	25	4.8%	20	3.9%	13	2.5%
Oesophagus	156	7.5%	47	2.3%	33	1.6%	23	1.1%
Colon	45	1.1%	14	0.3%	8	0.2%	4	0.1%
Rectum	27	1.9%	8	0.6%	5	0.4%	3	0.2%
Liver	37	4.0%	12	1.3%	7	0.8%	4	0.4%
Larynx	11	8.7%	3	2.4%	3	2.4%	2	1.6%
Breast	314	3.0%	171	1.7%	95	0.9%	31	0.3%
Other conditions								
Hypertensive diseases	118	5.9%	44	2.2%	29	1.4%	19	0.9%
Ischaemic stroke	-1,255	-6.7%	-104	-0.6%	45	0.2%	183	1.0%
Haemorrhagic stroke	156	3.9%	51	1.3%	68	1.7%	76	1.9%
Unspecified liver cirrhosis	163	22.8%	56	7.8%	56	7.8%	62	8.7%
Acute and chronic pancreatitis	25	4.9%	10	2.0%	7	1.4%	5	1.0%

Data from 2005

In males, for the majority of conditions (malignant neoplasm, hypertensive diseases, and acute and chronic pancreatitis), deaths attributable to alcohol consumption were spread evenly across the four categories. For haemorrhagic and ischaemic stroke, and unspecified liver cirrhosis, however, the majority of deaths were attributable to alcohol consumption greater than 40 g/day. In females, for many of the conditions examined (malignant neoplasm, hypertensive diseases, unspecified liver cirrhosis, haemorrhagic stroke) the majority of deaths attributable to alcohol consumption occurred at an intake of 1-19 g/day. These patterns largely occurred because of differences in the distribution of males and females across the different categories of alcohol consumption, as shown in Table 3. Among females, the majority drink less than 19 g/day and therefore this category of alcohol consumption contributes disproportionately to the total number of female deaths. However, among males, although more than half drink less than 19 g/day, a greater proportion drink above 40 g/day

compared to females. For the conditions presented drinking at these levels is associated with significantly increased risks and therefore consumption in the lowest and two highest categories contributed most to the total number of male deaths. These results are presented in Figures 3 to 6.

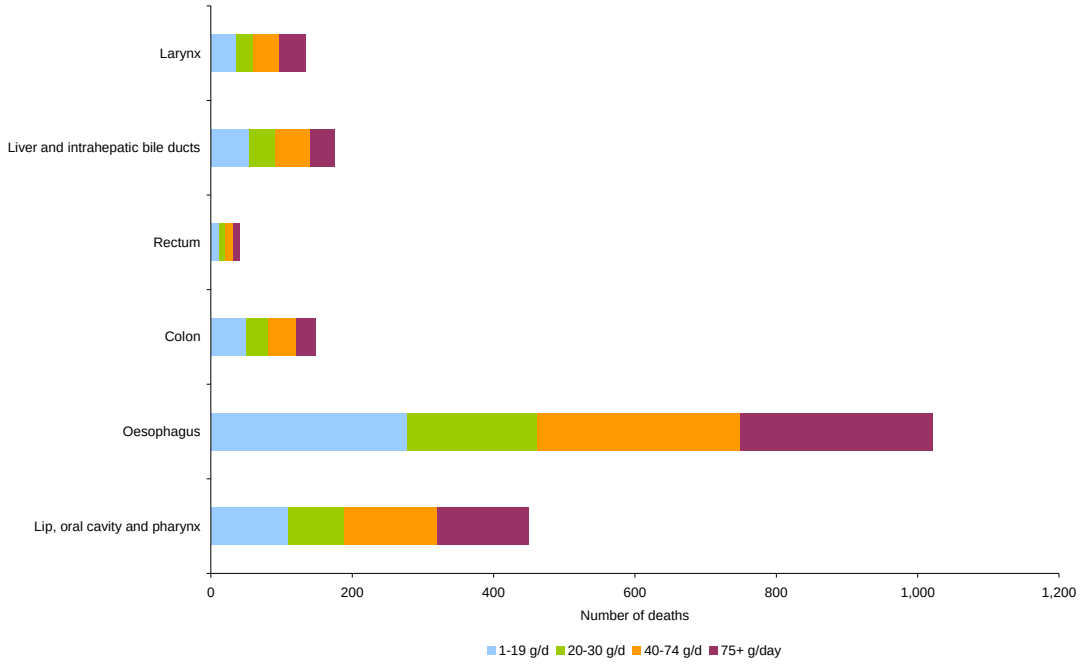

Figure 3. Number of male deaths from malignant neoplasm attributable to different levels of alcohol consumption (2005)

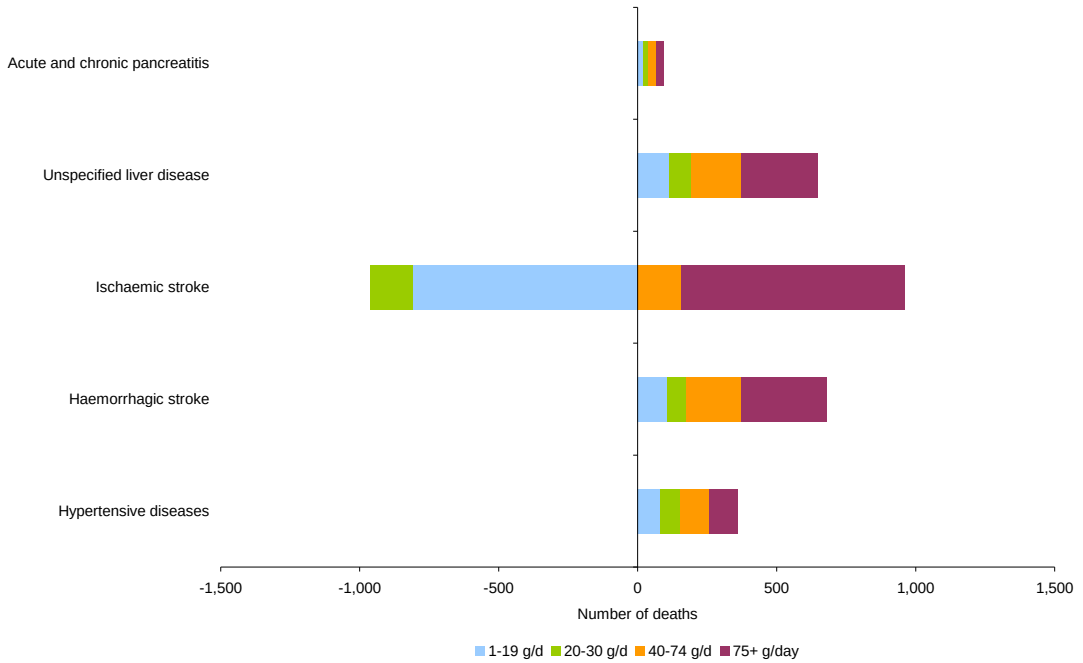

Figure 4. Number of males deaths from selected conditions attributable to different levels of alcohol consumption (2005)

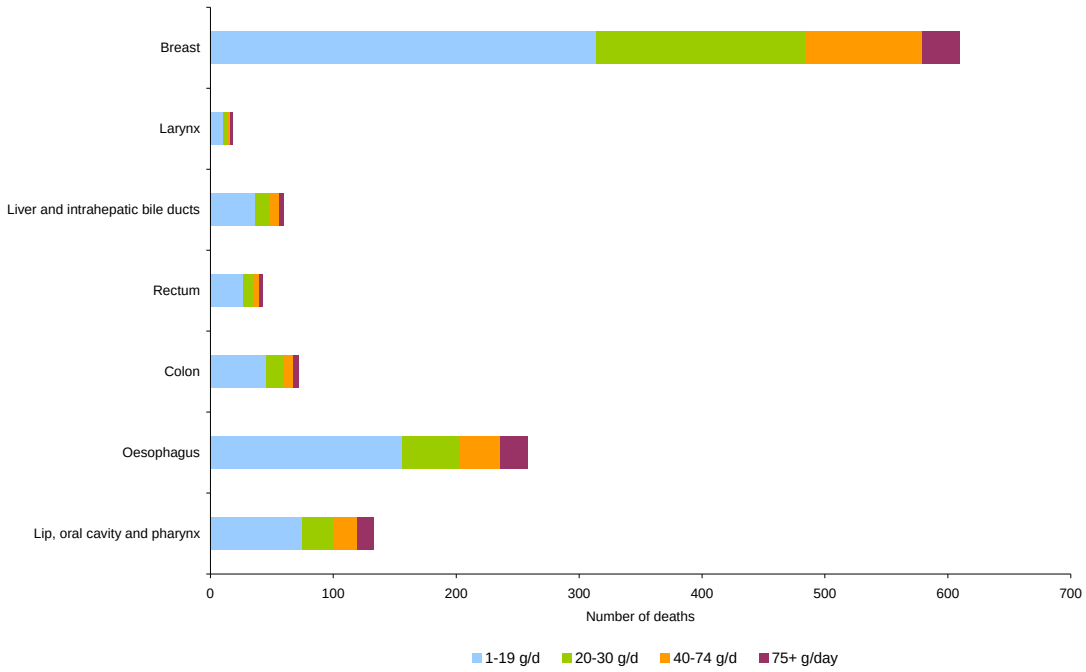

Figure 5. Number of female deaths from malignant neoplasm attributable to different levels of alcohol consumption (2005)

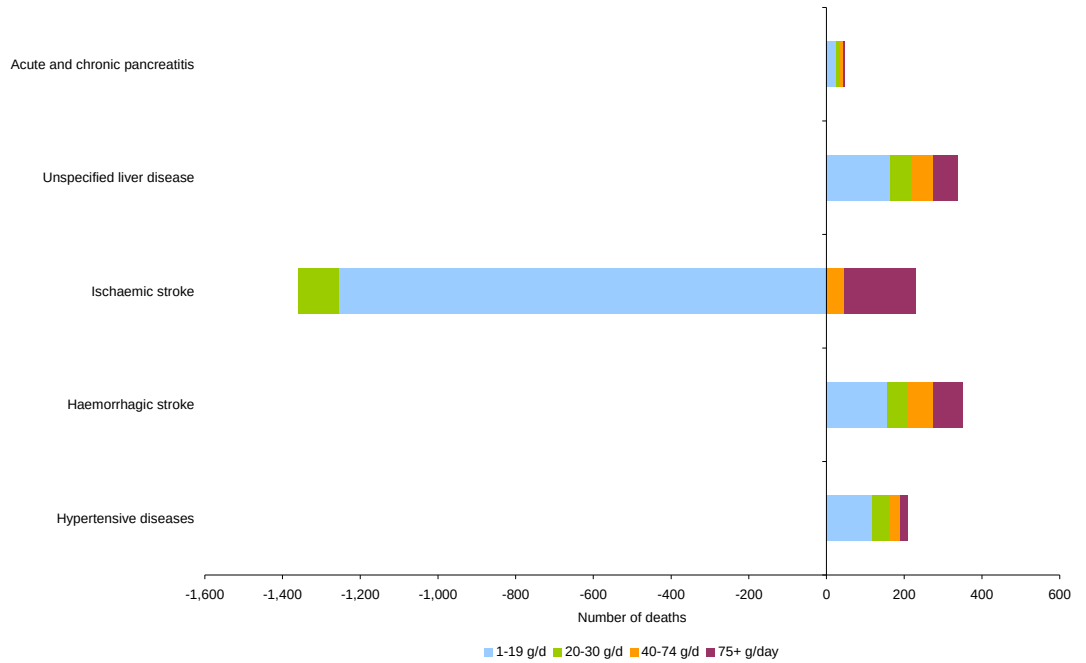

Figure 6. Number of female deaths from selected conditions attributable to different levels of alcohol consumption (2005)

3.5 Alcohol-attributable hospital admissions

There were a total of 459,842 people admitted to hospital in 2005/06 for alcohol-attributable conditions. Of these admissions, 125,391 people were admitted for conditions wholly attributable to alcohol consumption, and of conditions partially attributable to alcohol

consumption, 279,427 people were admitted for chronic conditions and 55,024 people were admitted for acute consequences. The number of people admitted to hospital in 2005 for alcohol-related conditions is shown in Table 8.

Table 8. Number of people admitted to hospital for alcohol-related conditions by age and sex

Age group	Males	Females	Total
16-24	19,533	15,939	35,472
25-34	22,647	17,180	39,827
35-44	33,971	22,446	56,417
45-54	42,472	23,039	65,511
55-64	55,197	27,764	82,961
65-74	54,069	27,088	81,157
75+	54,103	44,394	98,497
16-75+	*281,993*	*177,849*	*459,842*

Data from 2005

3.5.1 Reasons for alcohol-attributable hospital admissions

As shown in Figure 7, among males below the age of 44, hospital admissions were most commonly for conditions wholly attributable to alcohol consumption, in particular for mental and behavioural disorders due to alcohol (n=94,382). This condition was also the leading cause of all admissions in males under 55 year olds. As shown in Figure 8, for women over the age of 25, hospital admissions were most commonly for chronic conditions partially attributable to alcohol consumption. For males and females, the most common reasons for hospital admission were hypertensive diseases (n=133,307), mental and behavioural disorders due to use of alcohol (n=94,382) and cardiac arrhythmias (n=76,540). The top three reasons for hospital admissions by and age and sex are shown in Table 9.

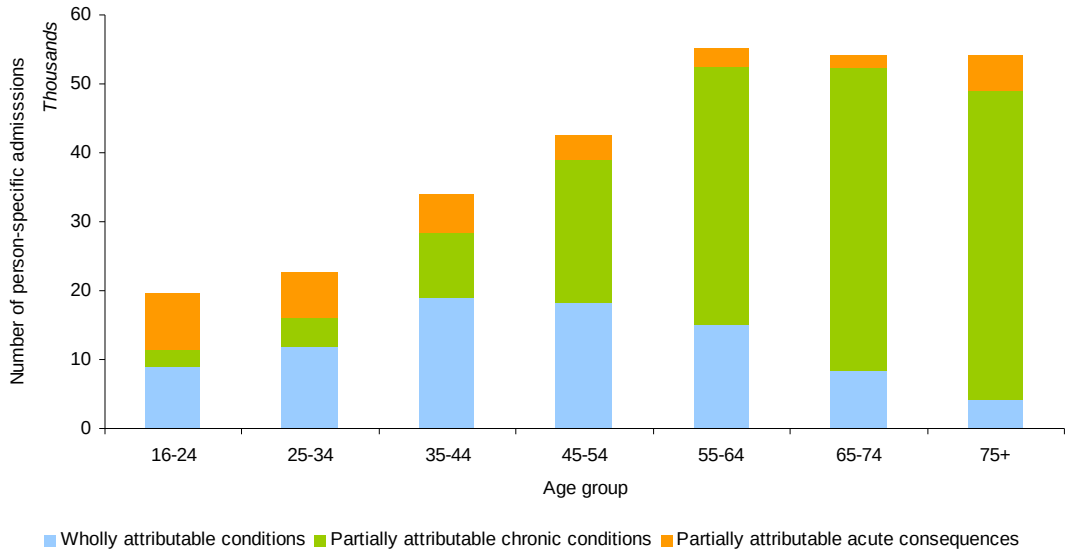

Figure 7. Number of male hospital admissions by type of condition (April 2005 to March 2006)

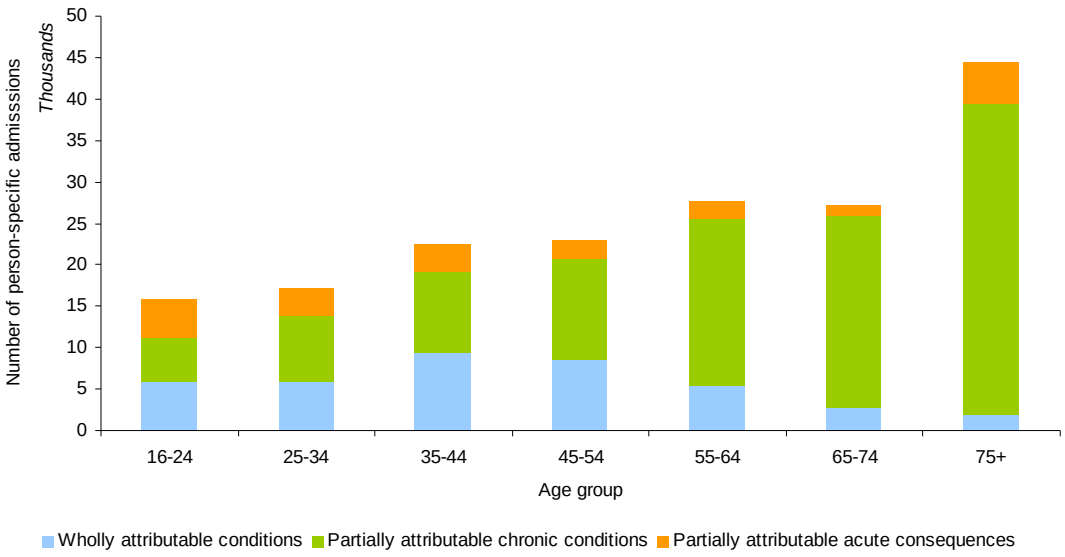

Figure 8. Number of female hospital admissions by type of condition (April 2005 to March 2006)

Table 9. Top three causes of hospital admissions by age and sex

Age	Males		Females	
	Condition	**n**	**Condition**	**n**
16-24	Mental and behavioural disorders due to use of alcohol	7,164	Intentional self-harm	3,310
	Assault	3,016	Mental and behavioural disorders due to use of alcohol	3,242
	Falls	1,925	Ethanol	2,452
25-34	Mental and behavioural disorders due to use of alcohol	9,554	Spontaneous abortion	3,603
	Epilepsy	1,966	Mental and behavioural disorders due to use of alcohol	3,595
	Assault	1,907	Epilepsy	2,757
35-44	Mental and behavioural disorders due to use of alcohol	15,396	Mental and behavioural disorders due to use of alcohol	6,075
	Hypertensive diseases	4,119	Epilepsy	3,062
	Epilepsy	2,558	Hypertensive diseases	2,476
45-54	Mental and behavioural disorders due to use of alcohol	14,527	Mental and behavioural disorders due to use of alcohol	14,527
	Hypertensive diseases	12,368	Hypertensive diseases	12,368
	Cardiac arrhythmias	2,649	Cardiac arrhythmias	2,649
55-64	Hypertensive diseases	23,317	Hypertensive diseases	23,317
	Mental and behavioural disorders due to use of alcohol	11,606	Mental and behavioural disorders due to use of alcohol	11,606
	Cardiac arrhythmias	7,058	Cardiac arrhythmias	7,058
65-74	Hypertensive diseases	25,438	Hypertensive diseases	12,593
	Cardiac arrhythmias	12,337	Cardiac arrhythmias	6,686
	Mental and behavioural disorders due to use of alcohol	6,527	Mental and behavioural disorders due to use of alcohol	1,972
75+	Cardiac arrhythmias	20,431	Cardiac arrhythmias	19,495
	Hypertensive diseases	19,292	Hypertensive diseases	13,699
	Falls	4,623	Falls	4,428
n = number of person-specific hospital admissions				

Data from April 2005 to March 2006

3.5.2 Hospital admissions attributable to different levels of alcohol consumption

For conditions where risk estimates were extracted from Corrao et al. (2004) it was possible to determine the number of person-specific hospital admissions attributable to specific levels of alcohol consumption, as shown in Table 10, and Figures 9 to 12. In males, for malignant neoplasm, hypertensive diseases, and acute and chronic pancreatitis, alcohol-related person-specific hospital admissions were spread evenly across the four categories of alcohol consumption. For ischaemic and haemorrhagic stroke, and unspecified liver cirrhosis the majority of hospital admissions were attributable to medium and high levels of consumption. In females, for the majority of the conditions examined, the majority of hospital admissions were attributable to alcohol consumption at 1-19 g/day. As discussed in Section 3.4.2, these gender based patterns largely occurred because of differences in the distribution of males and females across the different categories of alcohol consumption.

Table 10. Number of person-specific hospital admissions attributable to different levels of alcohol consumption

Condition	Alcohol consumption (g/day)							
	Males				Females			
	1-19	20-39	40-74	75+	1-19	20-39	40-74	75+
Malignant neoplasm								
Lip, oral cavity and pharynx	400	308	512	526	311	122	103	69
Oesophagus	527	362	568	566	284	93	68	49
Colon	151	102	132	97	130	44	28	15
Rectum	158	110	154	124	93	33	23	13
Liver	60	41	56	41	45	16	10	6
Larynx	163	116	186	192	41	16	13	9
Breast	0	0	0	0	1,213	816	499	162
Other conditions								
Hypertensive diseases	16,107	15,966	25,381	28,252	21,770	10,795	8,344	6,691
Ischaemic stroke	223	160	448	751	279	104	147	173
Haemorrhagic stroke	-1,877	-407	441	2,933	-1,887	-191	94	477
Unspecified liver cirrhosis	453	356	760	1,225	1,003	383	406	468
Acute and chronic pancreatitis	345	380	574	643	463	272	213	175

Data from April 2005 to March 2006

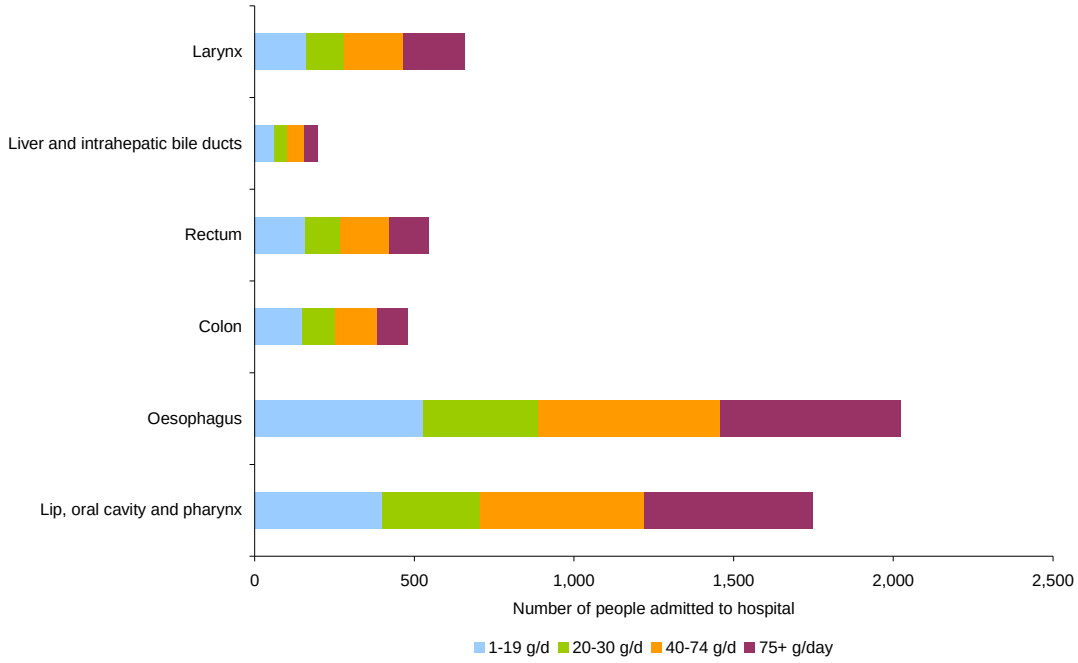

Figure 9. Number of male hospital admissions for malignant neoplasm attributable to different levels of alcohol consumption (April 2005 to March 2006)

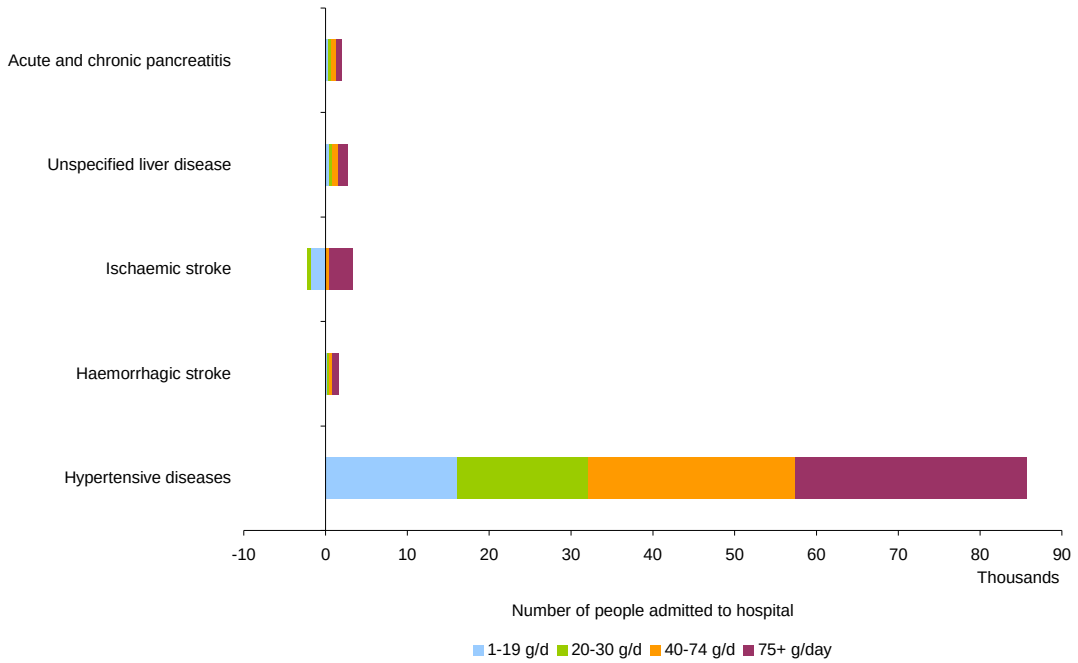

Figure 10. Number of male hospital admissions for selected conditions attributable to different levels of alcohol consumption (April 2005 to March 2006)

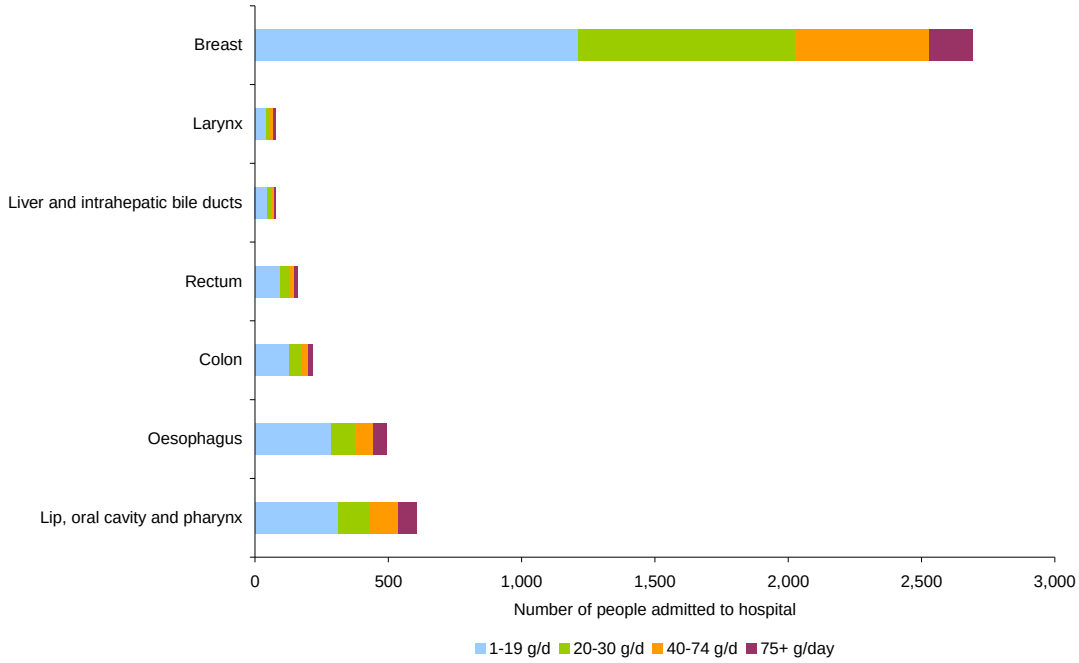

Figure 11. Number of female hospital admissions for malignant neoplasm attributable to different levels of alcohol consumption (April 2005 to March 2006)

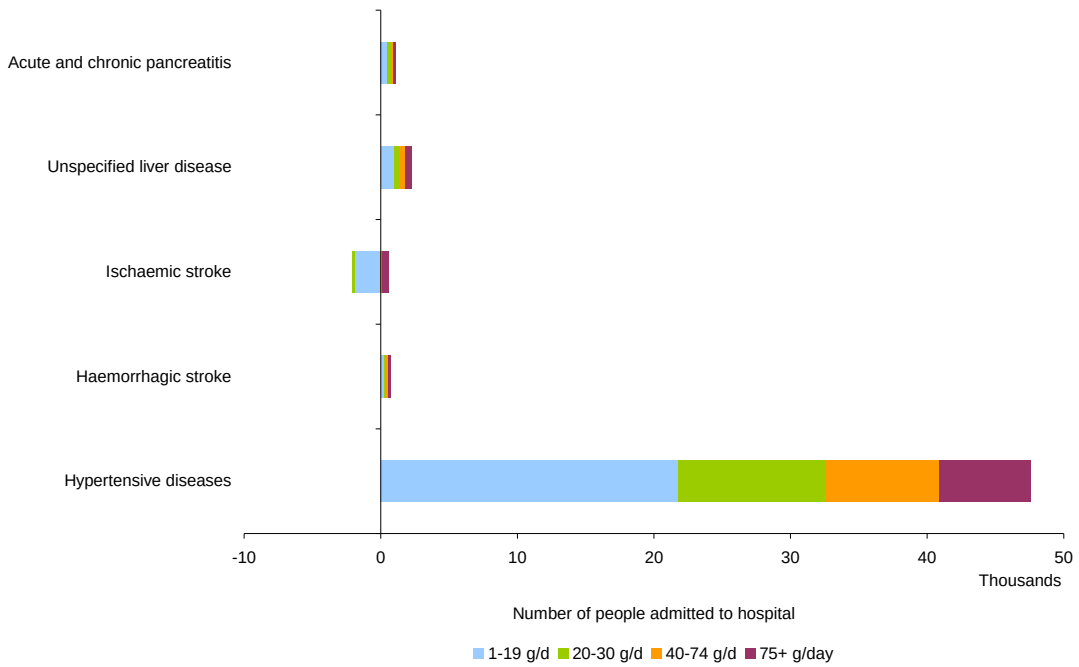

Figure 12. Number of female hospital admissions for selected conditions attributable to different levels of alcohol consumption (April 2005 to March 2006)

4 Beneficial health effects of alcohol consumption

4.1 Ischaemic heart disease

Currently the epidemiological evidence supports a protective effect of low levels of alcohol consumption on the risk of IHD, but there has been much debate regarding the true extent of the protective effects of alcohol. Shaper et al. (1998) originally hypothesised that a strong bias towards less healthy individuals being more likely to reduce or quit drinking may have created the appearance of a protective role of alcohol consumption against heart disease (the 'abstainer misclassification error'). Although this hypothesis was challenged (Jackson et al., 2005), Fillmore and colleagues have recently reopened the debate. Their analysis of the recent evidence demonstrates that in the few studies that have accounted appropriately for the abstainer misclassification error, abstainers and "light" or "moderate" drinkers were at equal risk for IHD mortality (Fillmore et al., 2006; 2007). It therefore remains probable that some or all of the apparent protective effects of alcohol are due to unmeasured or residual confounding. For example, a recent population-based study (Naimi et al., 2005) found that 90% of risk factors for cardiovascular disease[7] were more common among nondrinkers than moderate drinkers. There is also evidence to suggest that drinking patterns may impact on the relationship between alcohol and IHD risk with heavy patterns of drinking likely to diminish the protective effects. A large Australian study (McElduff and Dobson, 1997) found that men who had nine or more alcoholic drinks a day on one or two days a week approximately doubled their risk of a major coronary event compared to those who drank similar amounts but over five or six days of the week.

Corrao et al. (2000) undertook a comprehensive meta-analysis of 51 cohort and case-control studies that have examined the effects of alcohol consumption on IHD. They demonstrated evidence of a J-shaped relationship between alcohol consumption and IHD. In a meta-analysis of 28 high quality studies, the greatest protective effect was observed at 20 g/day and a significant increased harmful effect was reached at 89 g/day. However, both gender and the area in which the study was performed (Mediterranean vs. other countries) modified the effect. In women, the major protective effect occurred at 10 g/day (compared to 25 g/day in men) and significant evidence of harmful effects was found at 52 g/day (compared to 114 g/day in men). Corrao et al. (2000) also found that studies performed in Mediterranean countries tended to report a higher protective effect than studies performed in countries outside of the Mediterranean region.

Table 11 shows how the different RR estimates presented by Corrao et al. (2000) affect the size of the AAF calculated. Using risk estimates adjusted for area and gender resulted in smaller AAFs. Due to the ongoing debate regarding the protective effects of alcohol

[7] The authors examined 30 risk factors for CVD across five domains: demographic factors; social factors; behavioural factors; healthcare access; and health conditions.

consumption of IHD, we chose to use the more conservative figures adjusted for area and gender to determine the AAF for IHD. However, it was not possible to account for the effects of patterns of drinking on IHD risk and there remains the possibility that the apparent protective effects of alcohol demonstrated in the Corrao et al. (2000) meta-analysis may be due to residual or unmeasured confounding.

Table 11. Alcohol attributable fractions by age and sex for IHD

	Alcohol-attributable fractions for IHD by age							
	16-75+	**16-24**	**25-34**	**35-44**	**45-54**	**55-64**	**65-74**	**75+**
All studies								
Males	-0.15	-0.14	-0.14	-0.16	-0.15	-0.15	-0.15	-0.14
Females	-0.14	-0.15	-0.15	-0.16	-0.15	-0.14	-0.11	-0.09
Adjusted for area (non-Mediterranean) and gender								
Males	-0.09	-0.07	-0.08	-0.10	-0.07	-0.09	-0.10	-0.11
Females	-0.08	-0.06	-0.09	-0.09	-0.09	-0.08	-0.08	-0.07

4.2 Other conditions

Ischaemic stroke: Corrao et al., (2002) found a non-significant protective effect of alcohol consumption on ischaemic stroke at levels below 15 g/day. Other reviews of the risk of ischaemic stroke have concluded that moderate drinking (defined as two drinks a day for men and one drink a day for women) did not increase the risk of ischaemic stroke, but that there was no clear evidence of a protective effect (Ashley et al., 2000).

Diabetes: Corrao et al. (2002) commented that contradictory results had been reported in the literature regarding alcohol consumption and diabetes and did not calculate a risk estimate. However, Ashley et al. (2000) reported that there is growing evidence from cohort studies that moderate alcohol consumption reduces the risk of type II diabetes, and a meta-analysis of 15 cohort studies (Koppes et al., 2005) reported an approximate 30% reduction in the risk of type 2 diabetes in moderate alcohol drinkers, compared to non-drinkers and those consuming 48 g/day or more. However, risk estimates in this paper were not presented in a way that could be used in our calculations and risk estimates for type II diabetes were extracted from the meta-analysis by Gutjahr et al. (2001).

Cholelithiasis (gallstones): There is a small body of evidence to suggest that frequent and moderate alcohol consumption may be protective against gallstones and RR estimates were extracted from Gutjahr et al. (2001). There is evidence that the relationship between alcohol consumption and cholelithiasis may be mediated by patterns of drinking, with infrequent and/or episodic intake reducing the protective effect (Ashley et al., 2000).

4.3 Reductions in mortality associated with alcohol consumption

As described above alcohol has been shown to potentially reduce the risk of ischaemic heart, ischaemic stroke, type II diabetes and cholelithiasis. Our original analyses showed that overall an estimated 8,838 deaths may have been prevented (5,030 in males and 3,808 in females; 2005). However, the vast majority of deaths prevented were from IHD and occurred among

individuals aged over 75 years. Studies that have examined how the risks of heart disease change with increasing age have noted that in general, relative risks for risk factors for IHD converge towards 1, and Abbot et al. (2002) found that there was no evidence for a protective effect of alcohol in men aged 75 years or older. In addition, studies have found that IHD may be overrepresented as a cause of death on death certificates, particularly in older patients (Lloyd-Jones et al., 1998). Consequently, we excluded data on IHD deaths in males and females over 75 years old from our subsequent analyses. As shown in Table 12, this resulted in the number of deaths prevented being 3,813 (0.8% of all deaths), comprising 2,084 deaths in men and 1,729 deaths in women. Figures 13 and 14 show the percentage of deaths caused and prevented by alcohol consumption.

Table 12. Number (% of all deaths in each age group) of deaths prevented

Age	Males		Females*		Total	
	n	%	n	%	n	%
16-24	1	0.04%	0	0.0%	1	0.0%
25-34	6	0.2%	3	0.2%	9	0.2%
35-44	74	1.3%	14	0.4%	88	1.0%
45-54	164	1.5%	47	0.6%	211	1.1%
55-64	498	2.0%	145	0.9%	643	1.5%
65-74	1,097	2.3%	424	1.3%	1,521	1.9%
75+	244*	0.2%	1,096	0.6%	1,340	0.4%
All ages	2,084	0.9%	1,729	0.7%	3,813	0.8%

*Includes deaths from ischaemic stroke prevented

Data from 2005

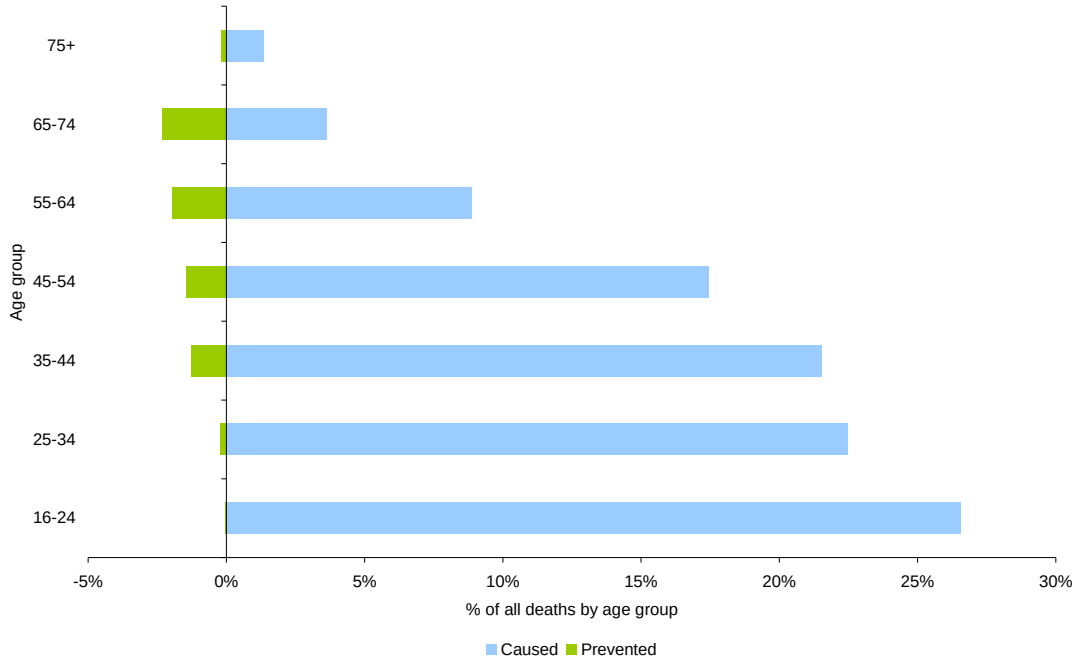

Figure 13. Percentage of male deaths attributable to alcohol consumption by age (2005)

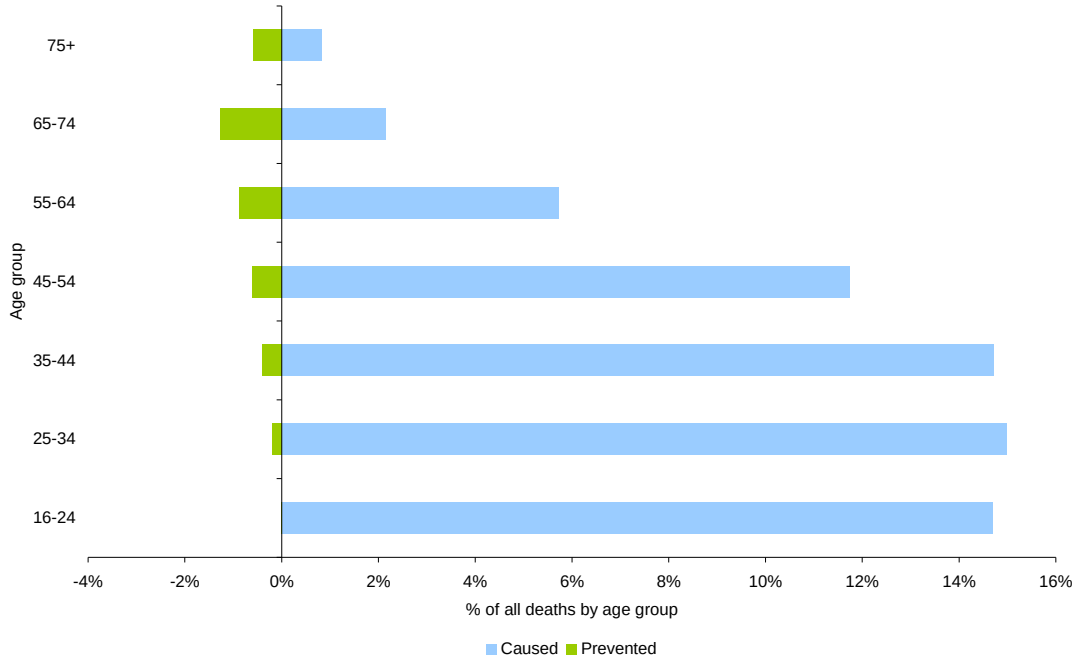

Figure 14. Percentage of female deaths attributable to alcohol consumption by age (2005)

4.4 Reductions in hospital admissions associated with alcohol consumption

As was found in the calculation of mortality rates, according to current evidence, some morbidity arising from IHD, diabetes and cholelithiasis was prevented by alcohol consumption. Analysing the hospital admissions data indicated that an estimated 40,287 people would be prevented from requiring a hospital admission, mainly arising from admissions prevented for cholelithiasis (n=16,560) and IHD (n=15,314). As with the mortality data, we excluded data on hospital admissions prevented from IHD in males and females aged over 75 years from our subsequent analyses. As shown in Table 13, this resulted in the number of people prevented from requiring a hospital admission to be 34,528 (16,929 males and 17,599 females). This is compared to the 459,842 people requiring admission for an alcohol-related condition, and as shown in Figures 15 and 16, the number of people requiring hospital admissions related to their alcohol consumption far outweighed the number of people prevented from requiring hospital admissions.

Table 13. Number of people prevented from requiring hospital admissions by age and sex

Age group	Males	Females*	Total
16-24	78	687	765
25-34	348	1,544	1,892
35-44	1,337	2,403	3,740
45-54	2,531	2,801	5,332
55-64	4,660	3,568	8,229
65-74	5,494	3,366	8,860
75+	2,481*	3,229	5,710
16-75+	*16,929*	*17,599*	*34,528*

*Includes hospital admissions from ischaemic stroke prevented

Data from April 2005 March 2006

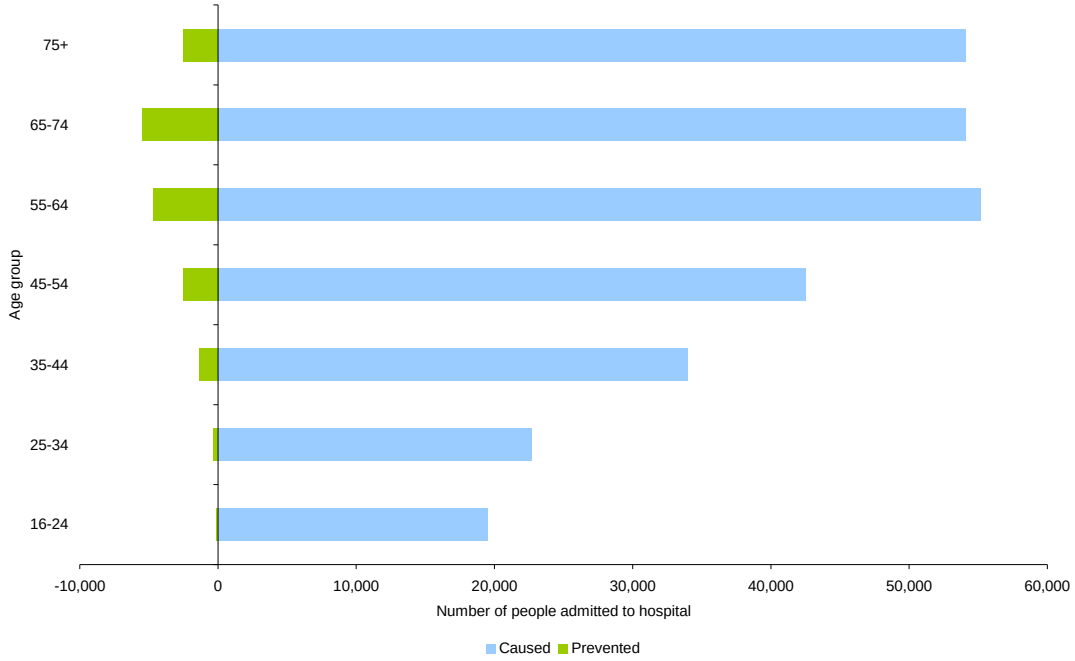

Figure 15. Number of male hospital admissions attributable to alcohol consumption (April 2005 to March 2006)

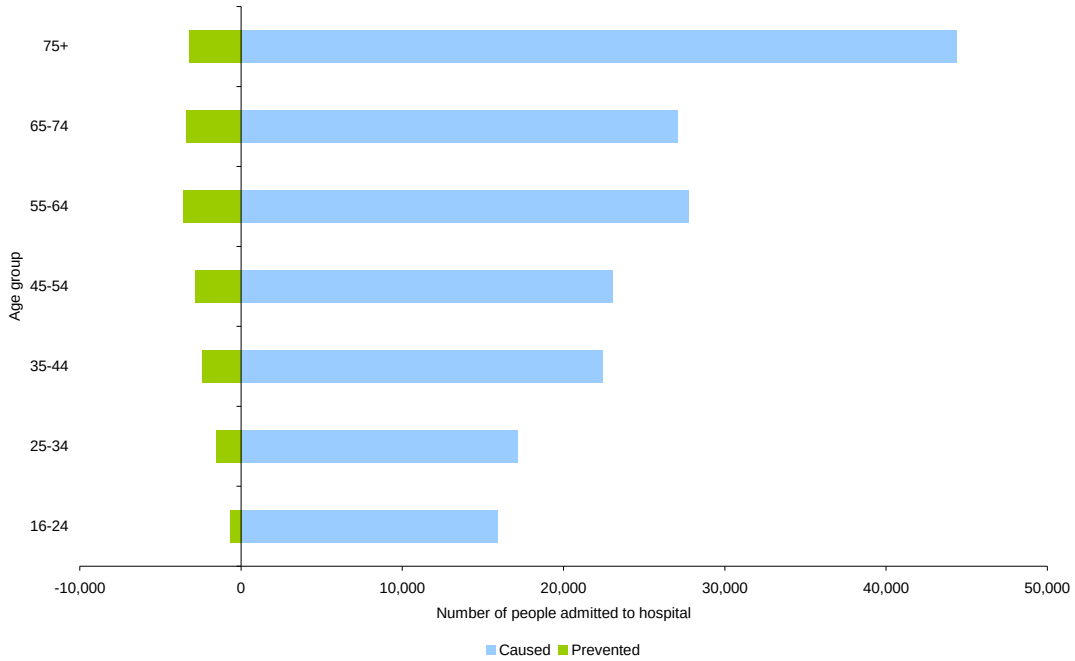

Figure 16. Number of female hospital admissions attributable to alcohol consumption (April 2005 to March 2006)

4.5 Beneficial effects of alcohol consumption across different levels of consumption

As discussed in Sections 4.1 and 4.2, Corrao et al., (2000, 2004) found protective effects of low to medium levels of alcohol consumption on IHD and ischaemic stroke, but increased risk at high levels of consumption. Therefore, estimates of mortality and morbidity for these conditions, as shown in Figures 17 and 18, represent a net estimate of cases of disease caused and prevented. As discussed in Section 3.4.2, these gender based patterns largely occurred because of differences in the distribution of males and females across the different categories of alcohol consumption.

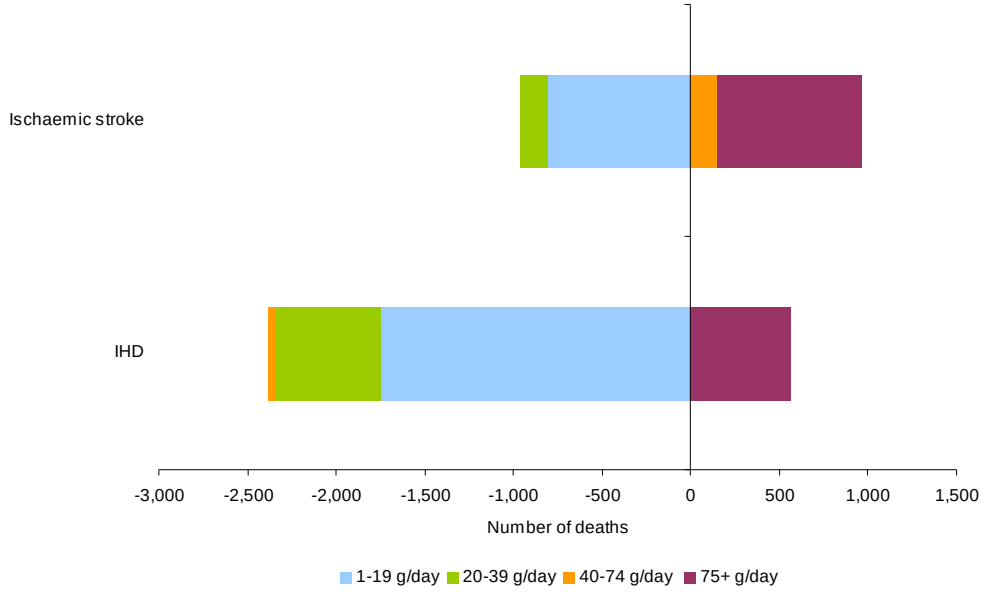

Figure 17. Number of male deaths caused and prevented across different levels of alcohol consumption (2005)

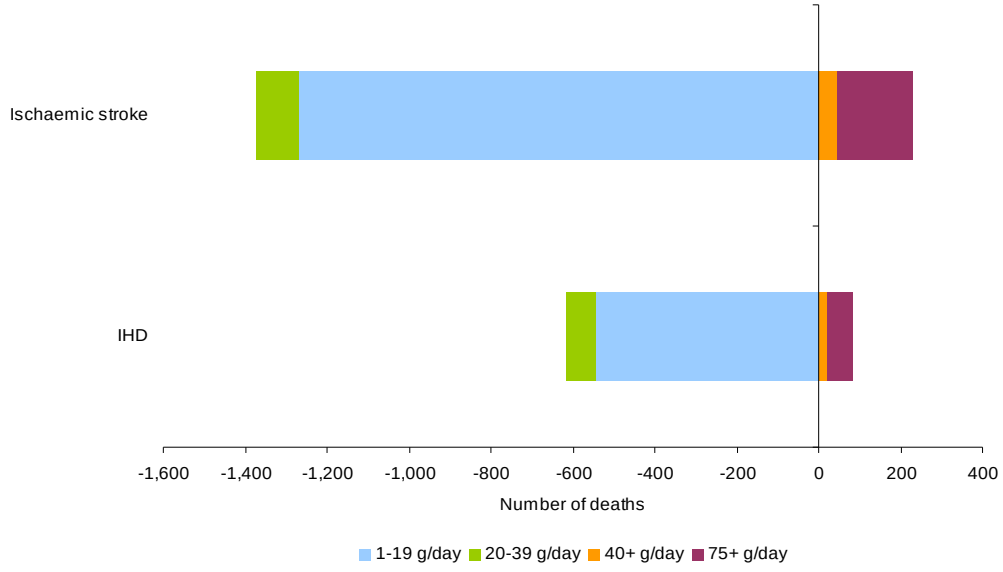

Figure 18. Number of female deaths caused and prevented across different levels of alcohol consumption (2005)

5 Discussion

Alcohol consumption has been linked to the development of a number of chronic conditions and acute consequences, ranging from malignant neoplasm to road traffic accidents. The calculation of attributable-fractions for conditions related to alcohol consumption can help to estimate the impact that alcohol has upon the health of the population. In England, AAFs were first applied to Hospital Episode Statistics (HES) and mortality data by the Cabinet Office/Strategy Unit to inform the first alcohol harm reduction strategy for England (2003). Currently, they are routinely applied to provide an indication of the public health effects of alcohol by the NWPHO (Deacon et al., 2007). This data has subsequently been used to develop alcohol profiles for each Local Authority in England, and the Local Alcohol Profiles for England (LAPE) online tool can help Local Authorities and communities better understand the total impact that alcohol is having on their health and social well-being (www.nwph.net/alcohol/lape). The aim of this report was to calculate updated AAFs for England, based on the current evidence available in the epidemiological literature, in order to provide best estimates of the health impacts of alcohol consumption in England.

AAFs were calculated for 47 conditions, of which 13 conditions were by definition wholly attributable to alcohol consumption and 34 conditions were partially attributable to alcohol consumption. The contribution of alcohol consumption varied across conditions. AAFs over 50% were calculated for three conditions, unspecified liver cirrhosis, oesophageal varices and epilepsy. Overall using the AAFs calculated in this study, 14,982 deaths were estimated to have been attributable to alcohol consumption, representing 3.1% of all deaths in England in 2005. Men were at greater risk of harm from their alcohol consumption than women; 4.4% of male deaths were alcohol-related compared to 2.0% of female deaths. This difference arises because males have higher levels of alcohol consumption, and does not reflect differences in relative risks between genders as for the vast majority of conditions, gender-specific RR estimates were not available for the calculation of AAFs. Alcohol-related deaths also varied by age, and young people were disproportionately affected by their alcohol use. For example, among males, 26.6% of all deaths in 16-24 year old were estimated to be attributable to alcohol consumption compared to 1.4% among those aged 75 and over. Below the age of 35, alcohol-related deaths were most likely to occur from the acute consequences of alcohol consumption, in particular, intentional self-harm and road traffic accidents. Beyond the age of 35 chronic diseases including alcoholic liver disease, malignant neoplasm of the oesophagus and breast, and hypertensive diseases were the most common causes of alcohol-related deaths. An estimated 459,842 people were admitted to hospital as a consequence of their alcohol consumption in England in 2005 based on the AAFs calculated in this study. The most common reasons for hospital admission in males and females were hypertensive diseases, mental and behavioural disorders due to use of alcohol, and cardiac arrhythmias. Mental and behavioural disorders due to use of alcohol, which included admissions for a wide variety of disorders relating to alcohol use, was the leading cause of admissions in males and females

under the age of 45. Although potentially up to 8,838 deaths were calculated to have been prevented by alcohol consumption, the majority were from the prevention of IHD deaths in individuals aged over 75 years where there is evidence that protective effects are diminished or absent. Consequently, we have excluded data on the number of deaths prevented from IHD in males and females aged over 75 years and estimate the number of deaths prevented at 3,813 (0.8% of all deaths). The number of people requiring hospital admissions related to their alcohol consumption (n=459,842) far outweighed the number of people prevented from requiring hospital admission (n=34,528).

AAFs were calculated with abstinence as the reference group. Although national policy is not targeted towards promoting total abstinence from alcohol, it is important to consider the effects of alcohol across all levels of consumption. For the conditions where risk estimates were reported for different categories of alcohol consumption, it was possible to determine the number of deaths attributable to specific levels of alcohol consumption. For malignant neoplasm, hypertensive diseases, and acute and chronic pancreatitis, male deaths were evenly distributed across all four categories of alcohol consumption (1-19 g/day, 20-39 g/day, 40-74 g/day, 75+ g/day), whereas female deaths were found to be attributable more to lower levels of alcohol consumption (1-19 g/day). For ischaemic and haemorrhagic stroke, and unspecified liver cirrhosis the majority of alcohol-related deaths were attributable to consumption exceeding 40 g/day. These findings suggest that there is a requirement for harm reduction strategies to target the general population, and not just high-risk drinkers. Consistent with findings for England in this study, a recent Finnish study (Poikolainen et al., 2007) found that among men, 70% of alcohol-related hospital admissions and 64% of alcohol-related deaths occurred in the 90% of light to moderate drinkers compared with the 10% of heavy drinkers.

There are limitations to the methods used to calculate AAFs. The calculation is a function of relative risk estimates and population drinking estimates and relies on the accuracy of population estimates of alcohol consumption and the availability and quality of the relative risk estimates reported in the epidemiological literature. There is, therefore, a degree of uncertainty surrounding the estimates presented, but as with other calculations of AAFs (e.g. Rehm et al., 2006; Ridolfo & Stevenson, 2001) we have not developed methodologies for calculating confidence intervals for each AAF. In order to integrate data from the most up to date epidemiological literature and survey data on alcohol consumption we calculated AAFs across four categories of alcohol consumption, where possible, with for each condition, an individual relative risk estimate applied to each drinking category. Within each category such methods are likely to underestimate alcohol-related risk for some conditions yet may overestimate them for others. However, existing research on risk estimates and estimates of population alcohol consumption were not considered sufficient to support multiple smaller categories. In addition, estimates of population consumption levels based on self-report may underestimate true consumption in the general population and estimates derived from population-based surveys such as the GHS have been shown to be consistently lower than

population consumption levels based on clearance data produced by HM Revenue and Customs (HMRC). For example, in 2005 data drawn from the GHS found that men and women reported an average weekly alcohol consumption of 15.8 units and 6.5 units, respectively (Goddard 2006). For the same year, estimates based on clearance data from the HMRC estimated that weekly alcohol consumption among adults was 21.9 units (HMRC 2007). We corrected data recorded by GHS to better reflect increases in the number of units in glasses of wine and stronger beers; such changes now having been adopted nationally (Goddard 2007). Our corrected data derived from the GHS suggests that an average adult consumes around 15 units per week and consequently may still underestimate population levels of consumption. The exact effects of any underestimation would depend upon whether heavier or more moderate drinkers are largely underestimating consumption. However, any underestimation in units consumed would mean that the number of deaths and people admitted to hospital for conditions related to their alcohol consumption will be higher than we have estimated here.

Good quality meta-analyses exploring the association between alcohol consumption and the risk of injury and disease were available but it was not possible to apply age- and gender-specific relative risk estimates consistently across the conditions examined because this information has largely not been reported in the literature. There is some evidence that relative risks may decline with age, for example, Rehm et al. (2006) have reported that the beneficial effects of alcohol on IHD would disappear if age-specific relative risk estimates were taken into account and studies that have examined how the risks of heart disease change with increasing age have noted that in general, relative risks for risk factors for IHD converge towards 1. For example, the Honolulu Heart Program (Abbot et al., 2002), which followed men over a 26 year period, found that there was no evidence of a protective effect of alcohol on IHD in men aged 75 years or older. There is also evidence that the risks of similar levels of alcohol use may not be equivalent for men and women (Graham et al., 1998). However, it was not possible to consistently account for gender differences across the conditions examined as relative risks estimates were not reported separately in the most recent meta-analysis by Corrao et al. (2004). In an earlier meta-analysis, Corrao et al. (1999) examined the effects of gender for a range of conditions, reporting that only a portion of the studies included had reported gender-specific estimates. Gender effects reached statistical significance for cancers of the oral cavity and rectum, and for liver cirrhosis. Evidence is also lacking on the latency periods between alcohol exposure and mortality and morbidity. It was therefore not possible to determine how volume and frequency of alcohol consumption at a younger age impacts on disease development and progression at a later stage in life. AAFs were therefore estimated based on the level of consumption in a single year and mortality determined according to the deaths in that same year. A further limitation concerns the use of risk estimates drawn from the international literature, as different drinking patterns between populations may modify the effects of alcohol consumption on injury and risk of disease. For example, Corrao et al. (1999) found that epidemiological studies performed in Mediterranean

countries tended to report higher risk of cancers of the upper digestive tract and breast, and liver cirrhosis compared to non-Mediterranean countries. The majority of epidemiological studies have not examined the impact of different drinking patterns on injury and risk of disease; although there is evidence that some patterns of drinking, such as irregular heavy drinking may increase risk. For example, a large Australian study (McElduff and Dobson, 1997) found that men who had nine or more alcoholic drinks a day on one or two days a week approximately doubled their risk of a major coronary event compared to those who drank similar amounts but over five or six days of the week. Further, the RR estimates used in the calculation of AAFs were based on pooled data from studies of incidence and mortality. The risks of the incidence of a condition may be differentially affected by alcohol consumption compared to mortality. For example, Corrao et al. (1999) found that outcome modified the effect of alcohol intake for injuries and adverse effects, with a higher slope for incident cases than for deaths. However, our analyses did not use the RR estimate for injuries and adverse effects reported by Corrao et al. (1999; 2004), in order to calculate separate AAFs for the acute consequences of alcohol consumption. Significant effects of outcome were not reported for the other conditions examined.

There is some evidence to suggest that alcohol consumption has protective effects in four conditions, IHD, ischaemic stroke, type II diabetes and cholelithiasis. The effects of alcohol consumption on heart disease have been extensively studied and low levels of consumption have been shown to be protective compared to medium to high levels of consumption and abstinence. However, there has been much debate regarding the true protective effects of alcohol and it has been suggested that a failure to separate former drinkers and occasional drinkers from complete abstainers may create a strong bias towards less healthy individuals being more likely to reduce or quit drinking (see Shaper et al., 1998; Fillmore et al., 2006). Fillmore et al. (2006) hypothesised that such a bias may have exaggerated or even created the appearance of a protective role of alcohol consumption against heart disease in light drinkers. In their meta-analysis examining alcohol and IHD, Corrao et al. (2002) found that high quality studies (including studies that had considered life-time abstainers only as the reference group), showed a lower protective effect of alcohol compared to all studies. As previously discussed, there is also some evidence to suggest that drinking patterns, particularly medium to high alcohol consumption over a short period (i.e. binge drinking), may also modify the dose-response relationship and diminish the protective effect seen at low levels of consumption.

In summary, alcohol plays a causal role in the development of a number of acute and chronic conditions. Despite the limitations of the evidence, we have used the best risk estimates and most recent alcohol consumption data available to calculate AAFs for England. These calculations reveal that there are a significant proportion of avoidable deaths and hospital admissions attributable to alcohol consumption each year, particularly in young people. The calculation of AAFs reveals that there were an estimated 14,982 deaths related to alcohol in 2005, and that 459,842 people were admitted to hospital as a result of their alcohol

consumption. The figures presented here are a conservative estimate of the harm attributable to alcohol consumption given the limitations of the current evidence and likely underestimation of population levels of alcohol consumption.

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Appendix 1. Calculation of alcohol consumption by age and sex

- Measures with uplifted alcohol content are:
    a. wine – original units * 2;
    b. strong beer – original units * 1.3;
    c. normal beer – original units * 1.2.
- Measures left as per original are: alcopops, sherry & spirits.
- The GHS records units consumed per week. These were converted into grammes per day by multiplying by 8 (grammes per unit) and dividing by 7 (days per week).
- To calculate AAFs alcohol consumption was graded into categories across all age-groups: 0 g, 1-19 g, 20-39 g, 40-74 g, 75+ g (grammes per day)[8].
- The mean number of grammes consumed in these categories was not altered significantly using the new methods.
- Using the 2005 mid-year population estimates and the above estimates, the total number of adults in England estimated to consume alcohol at these levels (grammes per day) is shown in Table 14.

Table 14. Number of adults consuming alcohol by age and sex in England

Age	0 g	1-19 g	20-39 g	40-74 g	75+ g	Total
Males						
16-24	545,579	1,312,670	619,416	299,453	237,922	3,015,040
25-34	595,079	1,405,722	692,234	443,273	209,492	3,345,800
35-44	478,117	1,761,787	883,791	567,945	173,861	3,865,500
45-54	393,142	1,358,612	700,701	460,002	267,443	3,179,900
55-64	398,640	1,287,915	559,040	459,970	169,835	2,875,400
65-74	399,287	980,069	333,496	197,375	81,672	1,991,900
75+	422,216	735,545	191,108	111,109	22,222	1,482,200
Total	*3,261,195*	*8,896,184*	*3,926,745*	*2,548,502*	*1,123,115*	*19,755,740*
Females						
16-24	690,130	1,483,614	470,089	150,028	100,019	2,893,880
25-34	803,202	1,884,338	458,973	160,640	48,447	3,355,600
35-44	904,397	2,161,730	590,677	191,173	58,823	3,906,800
45-54	826,111	1,709,857	463,487	196,922	38,424	3,234,800
55-64	901,266	1,526,448	362,788	155,155	31,944	2,977,600
65-74	956,157	1,015,369	171,056	37,281	19,737	2,199,600
75+	1,246,997	986,342	115,518	29,620	5,924	2,384,400
Total	*6,325,481*	*10,791,724*	*2,622,264*	*923,261*	*289,950*	*20,952,680*

Source: NWPHO from General Household Survey 2005 and ONS

[8] People consuming less than 0.5 g/day are classified as zero

Appendix 2. Detailed tables

Table 15. Mortality data for England in 2005

Disease/Related health problem	ICD-10	Number of deaths (2005)													
		16-24		25-34		35-44		45-54		55-64		65-74		75+	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Alcohol-induced pseudo-Cushing's syndrome	E24.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mental and behavioural disorders due to use of alcohol	F10	7	0	33	10	71	26	126	47	105	37	39	10	19	9
Degeneration of nervous system due to alcohol	G31.2	0	0	0	0	0	0	1	1	0	0	2	1	1	0
Alcoholic polyneuropathy	G62.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alcoholic myopathy	G72.1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Alcoholic cardiomyopathy	I42.6	0	0	2	0	9	3	15	5	20	2	5	4	8	2
Alcoholic gastritis	K29.2	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Alcoholic liver disease	K70	3	6	61	41	382	208	827	427	802	362	388	167	139	61
Chronic pancreatitis (alcohol-induced)	K86.0	1	0	4	0	7	1	18	2	11	2	2	3	0	1
Ethanol poisoning	T51.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Methanol poisoning	T51.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Toxic effect of alcohol, unspecified	T51.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accidental poisoning by and exposure to alcohol	X45	6	1	12	8	36	18	27	14	14	8	5	2	0	0
Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	3	2	3	1	37	11	157	42	283	100	252	114	254	247
Malignant neoplasm of oesophagus	C15	2	0	6	1	57	15	262	85	875	246	1,116	411	1,667	1,318
Malignant neoplasm of colon	C18	5	3	12	15	39	58	197	130	563	470	1,216	894	2,227	2,618
Malignant neoplasm of rectum	C20	1	1	5	1	9	13	41	66	108	138	198	287	245	884
Malignant neoplasm of liver and intrahepatic bile ducts	C22	5	5	10	5	24	17	106	45	241	109	424	227	553	515
Malignant neoplasm of larynx	C32	0	0	1	0	5	2	41	15	109	14	142	30	183	66
Malignant neoplasm of breast	C50	0	2	0	70	0	552	5	1,149	11	1,969	23	1,960	39	4,595
Epilepsy and status epilepticus	G40-G41	53	28	74	55	113	46	97	48	65	53	65	39	98	138
Hypertensive diseases	I10-I15	0	1	11	6	41	10	85	38	177	91	290	224	846	1,642
Cardiac arrhythmias	I47-I48	0	0	2	0	0	0	6	4	20	13	91	96	705	1,766
Heart failure	I50-I51	12	5	18	8	47	25	77	51	217	104	500	423	3,389	6,103
Haemorrhagic stroke	I60-I62, I69.0-I69.2	13	13	45	33	157	144	312	319	491	473	666	733	1,306	2,294
Ischaemic stroke	I63-I66, I69.3-I69.4	1	4	9	16	48	23	139	88	542	286	1,789	1,406	8,444	16,973
Oesophageal varices	I85	0	0	2	0	1	1	2	1	8	2	5	2	3	7
Gastro-oesophageal laceration-haemorrhage syndrome	K22.6	0	0	0	0	2	1	1	1	2	0	2	4	11	11
Unspecified liver cirrhosis	K73, K74	2	0	7	7	86	41	165	70	232	121	211	188	196	287
Acute and chronic pancreatitis	K85, K86.1	2	2	9	5	26	10	52	21	71	30	89	90	191	350

Disease/Related health problem	ICD-10	Number of deaths (2005)													
		16-24		25-34		35-44		45-54		55-64		65-74		75+	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Psoriasis	L40 excluding L40.5	0	0	0	0	1	0	1	0	2	1	2	0	1	3
Spontaneous abortion	O03	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Road traffic accidents	§	494	102	336	58	301	55	143	40	113	43	70	48	102	83
Pedestrian traffic accidents	§§	49	16	26	5	30	12	34	16	33	16	31	19	89	61
Water transport accidents	V90-V94	3	0	2	0	3	0	2	0	6	0	1	0	1	0
Air and space transport accidents	V95-V97	1	0	1	0	5	1	7	2	5	1	2	0	0	0
Falls	W00-W19	20	5	38	10	91	29	108	53	175	82	241	123	754	1,130
Work/machine injuries	W24-W31	1	2	2	0	7	0	5	0	5	1	0	1	2	0
Firearm injuries	W32-W34	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Drowning	W65-W74	25	0	16	3	19	1	21	10	18	8	12	6	10	6
Inhalation of gastric contents	W78-W79	4	0	6	4	17	5	15	15	27	7	25	13	50	81
Fire injuries	X00-X09	4	2	15	8	22	9	7	13	24	4	18	16	30	45
Accidental excessive cold	X31	2	1	1	0	4	0	4	1	5	5	6	3	12	31
Intentional self-harm/Event of undetermined intent	X60-X84, Y10-Y34	421	135	726	213	926	278	685	263	457	193	248	107	258	140
Assault	X85-Y09	19	4	25	4	9	5	11	5	7	5	2	0	1	1
Diabetes mellitus	E11	0	0	0	1	6	0	12	5	35	18	121	86	371	530
Ischaemic heart disease	I20-I25	10	1	77	17	704	146	2,242	477	5,626	1,525	10,618	4,643	26,342	29,367
Cholelithiasis	K80	0	0	0	1	1	0	5	5	14	16	36	39	119	262

§ V12-V14 (.3 -.9), V19.4-V19.6, V19.9, V20-V28 (.3 -.9), V29-V79 (.4 -.9), V80.3-V80.5, V81.1, V82.1, V82.9, V83-V86 (.0 -.3), V87.0-V87.9, V89.2, V89.3, V89.9
§§ V02-V04 (.1, .9), V06.1, V09.2, V09.3

Source: NWPHO from the Office for National Statistics

Table 16. Number of person-specific hospital admissions

Disease/Related health problem	ICD-10	Number of person-specific hospital admissions													
		16-24		25-34		35-44		45-54		55-64		65-74		75+	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Alcohol-induced pseudo-Cushing's syndrome	E24.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mental and behavioural disorders due to use of alcohol	F10	7,164	3,242	9,554	3,595	15,396	6,075	14,527	5,819	11,606	3,823	6,527	1,972	3,452	1,630
Degeneration of nervous system due to alcohol	G31.2	0	0	1	1	30	15	71	29	64	26	42	11	24	10
Alcoholic polyneuropathy	G62.1	0	0	6	4	9	4	25	15	33	8	20	5	11	6
Alcoholic myopathy	G72.1	0	0	0	0	2	1	8	1	10	1	5	1	4	1
Alcoholic cardiomyopathy	I426	0	0	7	0	46	6	119	9	159	11	103	3	37	9
Alcoholic gastritis	K29.2	65	30	91	19	128	39	97	28	55	17	30	9	14	3
Alcoholic liver disease	K70	18	10	233	167	1,229	675	2,316	1,139	2,590	1,091	1,467	657	522	267
Chronic pancreatitis (alcohol-induced)	K86.0	39	12	155	32	331	80	261	72	146	30	52	17	18	3
Ethanol poisoning	T51.0	1,550	2,452	1,700	1,959	1,639	2,321	839	1,239	340	385	96	105	46	43
Methanol poisoning	T51.1	1	3	3	1	2	4	4	3	1	0	0	0	1	2
Toxic effect of alcohol, unspecified	T51.9	54	80	53	63	79	76	36	40	13	20	3	5	2	1
Accidental poisoning by and exposure to alcohol	X45	79	77	55	48	53	54	34	29	13	13	9	2	5	7
Malignant neoplasms of lip, oral cavity and pharynx	C00-C14	21	21	54	55	208	137	742	321	1,119	498	896	496	703	598
Malignant neoplasm of oesophagus	C15	3	3	20	5	149	62	651	218	1,832	603	2,366	921	2,656	1,925
Malignant neoplasm of colon	C18	29	17	81	71	279	272	779	753	2,456	1,905	4,206	3,164	5,230	5,430
Malignant neoplasm of rectum	C20	5	8	29	40	151	142	646	386	1,836	888	2,712	1,295	2,531	1,895
Malignant neoplasm of liver and intrahepatic bile ducts	C22	14	10	18	13	51	31	118	85	298	183	461	296	549	490
Malignant neoplasm of larynx	C32	0	0	5	2	45	17	226	61	681	123	665	125	637	162
Malignant neoplasm of breast	C50	0	32	0	827	0	4,987	0	8,979	0	10,229	0	7,093	0	5,277
Epilepsy	G40-G41	2,843	3,641	3,398	4,662	4,415	5,044	4,300	4,546	4,677	4,655	4,835	4,375	5,873	7,065
Hypertensive diseases	I10-I15	597	726	2,957	3,122	13,018	12,467	33,865	32,168	69,561	65,259	92,519	96,392	94,466	146,992
Cardiac arrhythmias	I47-I48	621	729	1,320	1,276	3,339	2,023	6,977	3,668	18,884	9,919	36,610	25,077	68,005	87,037
Heart failure	I50-I51	175	119	247	203	407	278	634	432	1,161	856	1,915	1,652	4,964	7,224
Haemorrhagic stroke	I60-I62, I69.0-I69.2	115	95	233	184	508	542	868	871	1,161	1,047	1,467	1,306	2,197	2,952
Ischaemic stroke	I63-I66, I69.3-I69.4	52	62	164	200	610	506	1,697	1,070	4,444	2,385	7,673	5,406	12,386	17,418
Oesophageal varices	I85	48	34	70	49	176	95	369	176	455	287	393	329	275	267
Gastro-oesophageal laceration-haemorrhage syndrome	K22.6	308	255	311	172	261	127	133	91	177	118	239	153	353	328
Unspecified liver cirrhosis	K73, K74	70	75	142	130	610	327	783	567	881	986	675	1,252	658	1,164
Acute and chronic pancreatitis	K85, K86.1	232	497	591	812	1,177	1,086	1,350	1,177	1,550	1,494	1,478	1,521	1,625	2,234

Disease/Related health problem	ICD-10	Number of person-specific hospital admissions													
		16-24		25-34		35-44		45-54		55-64		65-74		75+	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Psoriasis	L40 excluding L40.5	142	315	298	443	514	439	514	396	517	436	327	294	247	319
Spontaneous abortion	O03	0	9,496	2	17,174	3	10,977	0	327	0	4	0	1	0	93
Road traffic accidents	§	5,051	1,892	3,098	1,348	2,906	972	1,736	730	1,217	648	589	505	638	733
Pedestrian traffic accidents	§§	94	53	84	36	76	34	52	34	39	55	28	34	58	78
Water transport accidents	V90-V94	31	9	47	11	56	14	28	12	33	11	11	12	7	11
Air and space transport accidents	V95-V97	5	1	18	6	32	3	18	2	10	2	7	1	0	0
Falls	W00-W19	8,752	4,258	7,586	5,071	7,582	5,520	6,694	6,600	8,016	11,303	10,993	19,646	38,526	110,695
Work/machine injuries	W24-W31	4,642	1,128	4,289	1,020	3,708	939	2,247	577	1,549	337	640	183	280	160
Firearm injuries	W32-W34	282	27	114	10	78	15	47	4	27	5	12	0	5	1
Drowning	W65-W74	12	8	5	4	10	8	10	4	11	6	9	4	11	12
Inhalation of gastric contents/Inhalation and ingestion of food causing obstruction of the respiratory tract	W78-W79	35	19	40	34	59	47	60	48	85	74	148	91	323	391
Fire injuries	X00-X09	300	81	240	83	202	88	140	64	104	60	92	60	113	166
Accidental excessive cold	X31	7	0	2	2	8	4	8	2	13	3	13	13	56	106
Intentional self-harm/Event of undetermined intent	X60-X84, Y10-Y34	4,792	9,332	4,690	5,690	4,214	5,726	2,169	3,170	1,101	1,467	532	759	637	897
Assault	X85-Y09	11,169	1,782	7,062	1,378	4,744	995	1,976	414	684	154	237	96	145	221
Diabetes mellitus	E11	265	305	942	1,102	3,370	3,288	7,253	5,887	12,539	8,802	17,290	12,488	17,768	17,932
Ischaemic heart disease	I20-I25	112	60	727	265	4,754	1,742	13,264	5,336	25,464	10,801	29,833	16,068	32,581	29,885
Cholelithiasis	K80	215	2,896	904	6,775	2,266	9,257	3,270	9,118	4,827	*10,805*	6,540	9,689	8,243	13,509

§ V12-V14 (.3 -.9), V19.4-V19.6, V19.9, V20-V28 (.3 -.9), V29-V79 (.4 -.9), V80.3-V80.5, V81.1, V82.1, V82.9, V83-V86 (.0 -.3), V87.0-V87.9, V89.2, V89.3, V89.9
§§ V02-V04 (.1, .9), V06.1, V09.2, V09.3

Source: NWPHO from Hospital Episode Statistics (HES) for 2005/06

N.B. Although we are aware of some minor coding errors in the HES data set (e.g. with age) we have not attempted to correct these during our analyses. However, errors identified are reported to HES services so that corrections will improve all subsequent HES calculations.

Table 17. Alcohol-attributable fractions by age and sex

Disease/Related health problem	ICD-10	Alcohol attributable fraction (%)													
		16-24		25-34		35-44		45-54		55-64		65-74		75+	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Alcohol-induced pseudo-Cushing's syndrome	E24.4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mental and behavioural disorders due to use of alcohol	F10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Degeneration of nervous system due to alcohol	G31.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Alcoholic polyneuropathy	G62.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Alcoholic myopathy	G72.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Alcoholic cardiomyopathy	I42.6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Alcoholic gastritis	K29.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Alcoholic liver disease	K70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Chronic pancreatitis (alcohol induced)	K86.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ethanol poisoning	T51.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Methanol poisoning	T51.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Toxic effect of alcohol, unspecified	T51.9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Accidental poisoning by and exposure to alcohol	X45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	0.50	0.40	0.50	0.35	0.49	0.36	0.53	0.35	0.50	0.33	0.44	0.26	0.36	0.20
Malignant neoplasm of oesophagus	C15	0.32	0.23	0.31	0.20	0.30	0.20	0.34	0.20	0.32	0.18	0.26	0.14	0.20	0.10
Malignant neoplasm of colon	C18	0.05	0.03	0.05	0.03	0.04	0.03	0.05	0.03	0.05	0.03	0.04	0.02	0.03	0.01
Malignant neoplasm of rectum	C20	0.08	0.06	0.08	0.05	0.08	0.05	0.09	0.05	0.08	0.05	0.07	0.03	0.05	0.03
Malignant neoplasm of liver and intrahepatic bile ducts	C22	0.16	0.11	0.15	0.10	0.15	0.10	0.17	0.10	0.16	0.09	0.13	0.07	0.10	0.05
Malignant neoplasm of larynx	C32	0.34	0.25	0.33	0.21	0.32	0.22	0.36	0.21	0.34	0.20	0.28	0.15	0.22	0.11
Malignant neoplasm of breast	C50	0.00	0.09	0.00	0.08	0.00	0.09	0.00	0.09	0.00	0.08	0.00	0.06	0.00	0.04
Epilepsy and Status epilepticus	G40-G41	0.56	0.64	0.58	0.59	0.58	0.61	0.61	0.61	0.61	0.57	0.51	0.45	0.42	0.35
Hypertensive diseases	I10-I15	0.34	0.24	0.33	0.19	0.32	0.20	0.37	0.20	0.34	0.18	0.27	0.13	0.20	0.09
Cardiac arrhythmias	I47-I48	0.35	0.36	0.36	0.35	0.37	0.35	0.38	0.35	0.37	0.33	0.34	0.27	0.30	0.22
Heart failure	I50-I51	0.004	0.002	0.004	0.002	0.004	0.002	0.004	0.002	0.004	0.002	0.004	0.002	0.004	0.002
Haemorrhagic stroke	I60-I62, I69.0-I69.2	0.31	0.20	0.30	0.15	0.27	0.15	0.34	0.15	0.30	0.13	0.24	0.10	0.16	0.06
Ischaemic stroke	I63-I66, I69.3-I69.4	0.16	0.03	0.13	-0.04	0.08	-0.04	0.18	-0.04	0.12	-0.05	0.06	-0.05	-0.02	-0.06
Oesophageal varices	I85	0.77	0.67	0.76	0.59	0.74	0.60	0.79	0.59	0.77	0.57	0.71	0.48	0.61	0.38
Gastro-oesophageal laceration-haemorrhage syndrome	K22.6	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Liver cirrhosis	K73, K74	0.77	0.67	0.76	0.59	0.74	0.60	0.79	0.59	0.77	0.57	0.71	0.48	0.61	0.38
Acute and chronic pancreatitis	K85, K86.1	0.27	0.19	0.27	0.16	0.26	0.16	0.30	0.16	0.27	0.14	0.22	0.10	0.16	0.07
Psoriasis	L40 excluding L40.5	0.34	0.33	0.34	0.33	0.35	0.33	0.36	0.32	0.35	0.31	0.33	0.26	0.30	0.22
Spontaneous abortion	O03	0.00	0.23	0.00	0.21	0.00	0.22	0.00	0.21	0.00	0.20	0.00	0.15	0.00	0.12

Disease/Related health problem		ICD-10	Alcohol attributable fraction (%)													
			16-24		25-34		35-44		45-54		55-64		65-74		75+	
			M	F	M	F	M	F	M	F	M	F	M	F	M	F
Road traffic accidents	Death	§	0.37	0.18	0.37	0.18	0.37	0.18	0.37	0.18	0.09	0.00	0.09	0.00	0.09	0.00
	Hospital admission		0.21	0.09	0.33	0.15	0.24	0.12	0.24	0.12	0.09	0.03	0.09	0.03	0.09	0.03
Pedestrian traffic accidents	Death	§§	0.69	0.50	0.58	0.22	0.51	0.42	0.51	0.42	0.16	0.06	0.16	0.06	0.16	0.06
	Hospital admission		0.35	0.16	0.45	0.19	0.46	0.21	0.46	0.21	0.23	0.03	0.23	0.03	0.23	0.03
Water transport accidents		V90-V94	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Air/space transport accidents		V95-V97	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Fall injuries		W00-W19	0.22	0.14	0.22	0.14	0.22	0.14	0.22	0.14	0.22	0.14	0.12	0.04	0.12	0.04
Work/machine injuries		W24-W31	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Firearm injuries		W32-W34	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Drowning		W65-W74	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Inhalation of gastric contents/Inhalation and ingestion of food causing obstruction of the respiratory tract		W78-W79	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Fire injuries		X00-X09	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Accidental excessive cold		X31	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Intentional self-harm/Event of undetermined intent		X60-X84, Y10-Y34	0.34	0.35	0.34	0.33	0.35	0.34	0.37	0.34	0.36	0.32	0.31	0.25	0.27	0.20
Assault		X85-Y09	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
Diabetes mellitus		E11	-0.08	-0.05	-0.09	-0.06	-0.09	-0.06	-0.10	-0.05	-0.10	-0.05	-0.06	-0.05	-0.04	-0.04
Ischaemic heart disease		I20-I25	-0.07	-0.06	-0.08	-0.09	-0.10	-0.09	-0.07	-0.09	-0.09	-0.08	-0.10	-0.08	-0.11	-0.07
Cholelithiasis		K80	-0.23	-0.23	-0.23	-0.21	-0.24	-0.22	-0.26	-0.22	-0.24	-0.19	-0.21	-0.14	-0.17	-0.11

§ V12-V14 (.3 -.9), V19.4-V19.6, V19.9, V20-V28 (.3 -.9), V29-V79 (.4 -.9), V80.3-V80.5, V81.1, V82.1, V82.9, V83-V86 (.0 -.3), V87.0-V87.9, V89.2, V89.3, V89.9
§§ V02-V04 (.1, .9), V06.1, V09.2, V09.3

Table 18. Alcohol-attributable deaths

Disease/Related health problem	ICD-10	Overall AAF%		Number of alcohol-attributable deaths (2005)															
				16-24		25-34		35-44		45-54		55-64		65-74		75+		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Alcohol-induced pseudo-Cushing's syndrome	E24.4	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mental and behavioural disorders due to use of alcohol	F10	1.00	1.00	7	0	33	10	71	26	126	47	105	37	39	10	19	9	400	139
Degeneration of nervous system due to alcohol	G31.2	1.00	1.00	0	0	0	0	0	0	1	1	0	0	2	1	1	0	4	2
Alcoholic polyneuropathy	G62.1	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alcoholic myopathy	G72.1	1.00	1.00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Alcoholic cardiomyopathy	I42.6	1.00	1.00	0	0	2	0	9	3	15	5	20	2	5	4	8	2	59	16
Alcoholic gastritis	K29.2	1.00	1.00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Alcoholic liver disease	K70	1.00	1.00	3	6	61	41	382	208	827	427	802	362	388	167	139	61	2,602	1,272
Chronic pancreatitis (alcohol induced)	K86.0	1.00	1.00	1	0	4	0	7	1	18	2	11	2	2	3	0	1	43	9
Ethanol poisoning	T51.0	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Methanol poisoning	T51.1	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Toxic effect of alcohol, unspecified	T51.9	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accidental poisoning by and exposure to alcohol	X45	1.00	1.00	6	1	12	8	36	18	27	14	14	8	5	2	0	0	100	51
Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	0.45	0.26	2	1	1	0	18	4	84	15	143	33	111	30	92	50	450	133
Malignant neoplasm of oesophagus	C15	0.26	0.12	1	0	2	0	17	3	90	17	278	45	295	57	339	137	1,021	258
Malignant neoplasm of colon	C18	0.03	0.02	0	0	1	0	2	2	10	4	26	12	46	17	64	37	149	72
Malignant neoplasm of rectum	C20	0.07	0.03	0	0	0	0	1	1	4	3	9	6	14	10	13	22	40	43
Malignant neoplasm of liver and intrahepatic bile ducts	C22	0.13	0.06	1	1	2	0	4	2	18	5	39	10	56	15	56	27	175	60
Malignant neoplasm of larynx	C32	0.28	0.14	0	0	0	0	2	0	15	3	37	3	40	4	40	7	134	18
Malignant neoplasm of breast	C50	NA	0.06	0	0	0	6	0	48	0	99	0	154	0	109	0	194	0	610
Epilepsy and Status epilepticus	G40-G41	0.55	0.50	29	18	43	33	65	28	59	29	39	30	33	17	41	48	311	203
Hypertensive diseases	I10-I15	0.25	0.10	0	0	4	1	13	2	31	7	59	16	80	29	173	153	359	210
Cardiac arrhythmias	I47-I48	0.31	0.23	0	0	1	0	0	0	2	1	7	4	31	26	212	396	253	427
Heart failure	I50-I51	0.004	0.002	0	0	0	0	0	0	0	0	1	0	2	1	14	12	17	13
Haemorrhagic stroke	I60-I62, I69.0-I69.2	0.23	0.09	4	3	13	5	43	22	106	47	147	64	158	70	207	141	679	351
Ischaemic stroke	I63-I66, I69.3-I69.4	-0.0002	-0.06	0	0	1	-1	4	-1	25	-4	66	-13	108	-65	-208	-1,047	-3	-1,130
Oesophageal varices	I85	0.73	0.46	0	0	2	0	1	1	2	1	6	1	4	1	2	3	15	6
Gastro-oesophageal laceration-haemorrhage syndrome	K22.6	0.47	0.47	0	0	0	0	1	0	0	0	1	0	1	2	5	5	8	8
Unspecified liver cirrhosis	K73, K74	0.72	0.47	2	0	5	4	64	25	131	41	178	69	150	90	119	109	649	338

Disease/Related health problem	ICD-10	Overall AAF%		Number of alcohol-attributable deaths (2005)															
				16-24		25-34		35-44		45-54		55-64		65-74		75+		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Acute and chronic pancreatitis	K85, K86.1	0.22	0.09	1	0	2	1	7	2	15	3	19	4	20	9	31	26	96	46
Psoriasis	L40 excluding L405	0.34	0.24	0	0	0	0	0	0	0	0	1	0	1	0	0	1	2	1
Spontaneous abortion	O03	NA	0.21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Road traffic accidents (driver/rider)	§	0.32	0.11	185	19	126	11	113	10	53	7	10	0	6	0	9	0	502	47
Pedestrian traffic accidents	§§	0.36	0.18	34	8	15	1	15	5	17	7	5	1	5	1	14	4	106	27
Water transport accidents	V90-V94	0.20	0.00	1	0	0	0	1	0	0	0	1	0	0	0	0	0	4	0
Air/space transport accidents	V95-V97	0.16	0.16	0	0	0	0	1	0	1	0	1	0	0	0	0	0	3	1
Fall injuries	W00-W19	0.15	0.05	4	1	8	1	20	4	24	7	39	11	29	5	90	45	214	75
Work/machine injuries	W24-W31	0.07	0.07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Firearm injuries	W32-W34	0.25	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drowning	W65-W74	0.34	0.34	9	0	5	1	6	0	7	3	6	3	4	2	3	2	41	12
Inhalation of gastric contents/Inhalation and ingestion of food causing obstruction of the respiratory tract	W78-W79	0.25	0.25	1	0	2	1	4	1	4	4	7	2	6	3	13	20	36	31
Fire injuries	X00-X09	0.38	0.38	2	1	6	3	8	3	3	5	9	2	7	6	11	17	46	37
Accidental excessive cold	X31	0.25	0.25	1	0	0	0	1	0	1	0	1	1	2	1	3	8	9	10
Intentional self-harm/Event of undetermined intent	X60-X84, Y10-Y34	0.34	0.31	142	48	249	71	323	95	251	89	164	61	78	26	70	28	1,276	418
Assault	X85-Y09	0.27	0.27	5	1	7	1	2	1	3	1	2	1	1	0	0	0	20	6
Diabetes mellitus	E11	-0.05	-0.04	0	0	0	0	-1	0	-1	0	-4	-1	-8	-4	-16	-21	-29	-26
Ischaemic heart disease	I20-I25	-0.04	-0.01	-1	0	-6	-2	-73	-13	-162	-42	-491	-128	-1,082	-350	0	0	-1,815	-535
Cholelithiasis	K80	-0.19	-0.12	0	0	0	0	0	0	-1	-1	-3	-3	-7	-5	-20	-28	-32	-38

§ V12-V14 (.3 -.9), V19.4-V19.6, V19.9, V20-V28 (.3 -.9), V29-V79 (.4 -.9), V80.3-V80.5, V81.1, V82.1, V82.9, V83-V86 (.0 -.3), V87.0-V87.9, V89.2, V89.3, V89.9
§§ V02-V04 (.1, .9), V06.1, V09.2, V09.3

Table 19. Alcohol-attributable person-specific hospital admissions

Disease/Related health problem	ICD-10	Overall AAF%		Number of alcohol-attributable person-specific hospital admissions (April 2005 to March 2006)															
				16-24		25-34		35-44		45-54		55-64		65-74		75+		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Alcohol-induced pseudo-Cushing's syndrome	E24.4	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mental and behavioural disorders due to use of alcohol	F10	1.00	1.00	7,164	3,242	9,554	3,595	15,396	6,075	14,527	5,819	11,606	3,823	6,527	1,972	3,452	1,630	68,226	26,156
Degeneration of nervous system due to alcohol	G31.2	1.00	1.00	0	0	1	1	30	15	71	29	64	26	42	11	24	10	232	92
Alcoholic polyneuropathy	G62.1	1.00	1.00	0	0	6	4	9	4	25	15	33	8	20	5	11	6	104	42
Alcoholic myopathy	G72.1	1.00	1.00	0	0	0	0	2	1	8	1	10	1	5	1	4	1	29	5
Alcoholic cardiomyopathy	I42.6	1.00	1.00	0	0	7	0	46	6	119	9	159	11	103	3	37	9	471	38
Alcoholic gastritis	K29.2	1.00	1.00	65	30	91	19	128	39	97	28	55	17	30	9	14	3	480	145
Alcoholic liver disease	K70	1.00	1.00	18	10	233	167	1,229	675	2,316	1,139	2,590	1,091	1,467	657	522	267	8,375	4,006
Chronic pancreatitis (alcohol induced)	K86.0	1.00	1.00	39	12	155	32	331	80	261	72	146	30	52	17	18	3	1,002	246
Ethanol poisoning	T51.0	1.00	1.00	1,550	2,452	1,700	1,959	1,639	2,321	839	1,239	340	385	96	105	46	43	6,210	8,504
Methanol poisoning	T51.1	1.00	1.00	1	3	3	1	2	4	4	3	1	0	0	0	1	2	12	13
Toxic effect of alcohol, unspecified	T51.9	1.00	1.00	54	80	53	63	79	76	36	40	13	20	3	5	2	1	240	285
Accidental poisoning by and exposure to alcohol	X45	1.00	1.00	79	77	55	48	53	54	34	29	13	13	9	2	5	7	248	230
Malignant neoplasms of lip, oral cavity and pharynx	C00-C14	0.47	0.28	11	8	27	19	101	49	395	113	565	165	395	129	254	122	1,746	605
Malignant neoplasm of oesophagus	C15	0.26	0.13	1	1	6	1	45	12	223	43	581	111	625	127	541	200	2,023	494
Malignant neoplasm of colon	C18	0.04	0.02	1	1	4	2	13	8	40	21	115	49	159	59	150	77	481	217
Malignant neoplasm of rectum	C20	0.07	0.03	0	0	2	2	12	7	60	20	156	41	185	44	131	48	546	162
Malignant neoplasm of liver and intrahepatic bile ducts	C22	0.13	0.07	2	1	3	1	8	3	20	9	48	17	61	20	56	25	198	77
Malignant neoplasm of larynx	C32	0.29	0.16	0	0	2	0	14	4	82	13	231	24	189	19	140	18	658	79
Malignant neoplasm of breast	C50	NA	0.07	0	3	0	69	0	430	0	771	0	800	0	394	0	223	0	2,690
Epilepsy	G40-G41	0.54	0.53	1,581	2,314	1,966	2,757	2,558	3,062	2,636	2,760	2,832	2,669	2,460	1,960	2,459	2,469	16,493	17,990
Hypertensive diseases	I10-I15	0.28	0.13	201	173	971	602	4,119	2,476	12,368	6,303	23,317	11,755	25,438	12,593	19,292	13,699	85,706	47,601
Cardiac arrhythmias	I47-I48	0.33	0.25	219	264	474	443	1,232	715	2,649	1,279	7,058	3,258	12,337	6,686	20,431	19,495	44,401	32,139
Heart failure	I50-I51	0.004	0.002	1	0	1	0	2	1	3	1	5	2	8	3	20	14	38	22
Haemorrhagic stroke	I60-I62, I69.0-I69.2	0.24	0.10	36	19	69	27	138	81	294	128	348	141	348	125	349	182	1,583	703
Ischaemic stroke	I63-I66, I69.3-I69.4	0.04	-0.06	9	2	22	-9	48	-21	308	-48	544	-108	465	-248	-305	-1,075	1,090	-1,506
Oesophageal varices	I85	0.73	0.51	37	23	53	29	131	57	293	104	349	163	279	158	168	101	1,310	635
Gastro-oesophageal laceration-haemorrhage syndrome	K22.6	0.47	0.47	145	120	146	81	123	60	63	43	83	55	112	72	166	154	838	585

Disease/Related health problem	ICD-10	Overall AAF%		Number of alcohol-attributable person-specific hospital admissions (April 2005 to March 2006)															
				16-24		25-34		35-44		45-54		55-64		65-74		75+		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Unspecified liver cirrhosis	K73, K74	0.73	0.50	54	50	108	77	454	196	622	336	675	561	479	600	401	441	2,793	2,261
Acute and chronic pancreatitis	K86.1, K85	0.24	0.13	63	95	157	126	303	174	402	186	423	216	327	158	267	167	1,943	1,122
Psoriasis	L40 excluding L40.5	0.34	0.30	49	105	102	144	180	144	185	128	181	135	108	76	74	71	878	803
Spontaneous abortion	O03	NA	0.22	0	2,156	0	3,603	0	2,374	0	70	0	1	0	0	0	11	0	8,214
Road traffic accidents (driver/rider)	§	0.22	0.09	1,035	178	1,013	202	697	121	417	91	114	16	55	13	60	18	3,392	638
Pedestrian traffic accidents	§§	0.37	0.11	33	8	38	7	35	7	24	7	9	2	6	1	13	2	158	35
Water transport accidents	V90-V94	0.20	0.20	6	2	9	2	11	3	6	2	7	2	2	2	1	2	43	16
Air and space transport accidents	V95-V97	0.16	0.16	1	0	3	1	5	0	3	0	2	0	1	0	0	0	14	2
Falls	W00-W19	0.16	0.06	1,925	596	1,669	710	1,668	773	1,473	924	1,764	1,582	1,319	786	4,623	4,428	14,441	9,799
Work/machine injuries	W24-W31	0.07	0.07	325	79	300	71	260	66	157	40	108	24	45	13	20	11	1,215	304
Firearm injuries	W32-W34	0.25	0.25	71	7	29	3	20	4	12	1	7	1	3	0	1	0	141	16
Drowning	W65-W74	0.34	0.34	4	3	2	1	3	3	3	1	4	2	3	1	4	4	23	16
Inhalation of gastric contents/Inhalation and ingestion of food causing obstruction of the respiratory tract	W78-W79	0.25	0.25	9	5	10	9	15	12	15	12	21	19	37	23	81	98	188	176
Fire injuries	X00-X09	0.38	0.38	114	31	91	32	77	33	53	24	40	23	35	23	43	63	453	229
Accidental excessive cold	X31	0.25	0.25	2	0	1	1	2	1	2	1	3	1	3	3	14	27	27	33
Intentional self-harm	X60-X84, Y10-Y34	0.34	0.34	1,613	3,310	1,606	1,896	1,471	1,953	795	1,072	394	464	167	187	173	180	6,217	9,064
Assault	X85-Y09	0.27	0.27	3,016	481	1,907	372	1,281	269	534	112	185	42	64	26	39	60	7,025	1,361
Diabetes mellitus	E11	-0.07	-0.05	-20	-16	-82	-64	-302	-193	-731	-319	-1,258	-451	-1,108	-571	-790	-697	-4,290	-2,311
Ischaemic heart disease	I20-I25	-0.06	-0.04	-8	-4	-59	-24	-495	-159	-957	-467	-2,224	-908	-3,039	-1,212	0	0	-6,782	-2,773
Cholelithiasis	K80	-0.21	-0.18	-49	-667	-207	-1,447	-541	-2,030	-843	-1,967	-1,179	-2,102	-1,347	-1,335	-1,387	-1,457	-5,553	-11,007

§ V12-V14 (.3 -.9), V19.4-V19.6, V19.9, V20-V28 (.3 -.9), V29-V79 (.4 -.9), V80.3-V80.5, V81.1, V82.1, V82.9, V83-V86 (.0 -.3), V87.0-V87.9, V89.2, V89.3, V89.9
§§ V02-V04 (.1, .9), V06.1, V09.2, V09.3

N.B. Although we are aware of some minor coding errors in the HES data set (e.g. with age) we have not attempted to correct these during our analyses. However, errors identified are reported to HES services so that corrections will improve all subsequent HES calculations.

Appendix 3. Previous alcohol-attributable fractions

Table 20. AAFs used by the Strategy Unit/Cabinet Office (2003)

Disorder	ICD-9 Codes	AF (Lowest)	AF (Highest)	AF (Men L)	AF (Men H)	AF (Women L)	AF (Women H)
Alcoholic Psychosis	291	1	1	1	1	1	1
Alcohol Dependence	303	1	1	1	1	1	1
Alcohol Abuse	305.0	1	1	1	1	1	1
Alcoholic Polyneuropathy	357.5	1	1	1	1	1	1
Alcoholic Cardiomyopathy	425.5	1	1	1	1	1	1
Alcohol Gastritis	535.3	1	1	1	1	1	1
Alcoholic Liver Cirrhosis	571.0-571.3	1	1	1	1	1	1
Ethanol Toxicity	980	1	1	1	1	1	1
Methanol Toxicity	980.1	1	1	1	1	1	1
Alcohol Bev Poisoning	E860.0	1	1	1	1	1	1
Other Ethanol Poisoning	E860.1-E860.2	1	1	1	1	1	1
Respiratory tuberculosis	011-012	0.25	0.25				
Lip Cancer	140	0.5	0.5				
Oropharyngeal Cancer	141-143-146, 148,149	0.08	0.5	0.21	0.29	0.08	0.15
Oesophageal Cancer	150	0.06	0.75	0.14	0.38	0.06	0.22
Stomach Cancer	151	0.2	0.2				
Colorectal Cancer	153,154	0.2	0.2				
Liver Cancer	155	0.12	0.29	0.18	0.29	0.12	0.16
Laryngeal Cancer	161	0.26	0.5	0.41		0.26	
Female Breast Cancer	174	0.03	0.04			0.03	0.04
Diabetes	250	0.05	0.05				
Epilepsy	345	0.15	0.15	0.15		0.15	
Hypertension	401-405	0.01	0.11	0.05	0.11	0.01	0.06
Ischaemic Heart Disease	410-414	0.005	0.005	0.005		0.005	
Supra ventricular cardiac Arrhythmias	427.0, 427.2, 427.3	0.05	0.26	0.08	0.26	0.05	0.13
Heart Failure	428-429	0.004	0.002	0.004		0.002	
Stroke	430-438	0.001	0.16	0.023	0.14	0.001	0.16
Oesophageal Varices	456.0-456.2	0.217	0.54	0.388	0.54	0.217	0.43
Pneumonia and influenza	480-487	0.05	0.05				
Gastro-Oesophageal	530. 7	0.1	0.47	0.1	0.47	0.1	0.47
Peptic Ulcer	531-534	0.1	0.1				
Unspecified Cirrhosis	571.5-571.9	0.43	0.54	0.5	0.54	0.43	0.54
Cholelithiasis	574	-0.05	-0.02	-0.05		-0.02	
Acute Pancreatitis	577	0.24	0.42	0.24		0.24	
Chronic Pancreatitis	577.1	0.6	0.84	0.84	0.84		
Sponteneous Abortion	634	0.04	0.2			0.04	0.2
Low Birthweight	656.5,	764,	765	-0.02	-0.02		
Psoriasis	696.1	0.01	0.03	0.03		0.01	
Road Injuries	E810-E819	0.18	0.43	0.37	0.43	0.18	0.43
Other Road Accidents	E826,E829	0.2	0.2	0.2		0.2	
Water Transport Accidents	E839-E838	0.2	0.2	0.2		0.2	
Air/Space Transport Accidents	E840-E845	0.2	0.2	0.2		0.2	
Fall Injuries	E880-E888	0.152	0.35	0.238	0.34	0.152	0.34
Fire Injuries	E890-E899	0.375	0.45	0.375	0.44	0.375	0.44

Disorder	ICD-9 Codes	AF (Lowest)	AF (Highest)	AF (Men L)	AF (Men H)	AF (Women L)	AF (Women H)
Accidental Excessive Cold	E901	0.25	0.25	0.25		0.25	
Drowning	E910	0.227	0.38	0.299	0.34	0.227	0.34
Aspiration	E911	0.25	1	0.25	1	0.25	1
Work/Machine Injuries	E919-E920	0.07	0.25	0.07		0.07	
Accidents with Firearms	E922	0.25	0.25	0.25		0.25	
Suicide	E950-E959	0.16	0.41	0.272	0.41	0.16	0.168
Assault	E960,65,66,68,69	0.27	0.47	0.27	0.47	0.27	0.47
Child Abuse	E967	0.16	0.16	0.16		0.16	
All-Cause Mortality	All of the above	0.034	0.07	0.034	0.07	0.034	0.04

Adapted from the International Guide for monitoring alcohol consumption and related harm (2000) published by WHO

Table 21. AAFs used to calculate the national indicator for alcohol, NI 39 (provisional figures produced in November 2007*)

		Alcohol attributable fraction (%)															
		0-15		16-24		25-34		35-44		45-54		55-64		65-74		75+	
Disease/Related health problem	**ICD-10**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Alcohol-induced pseudo-Cushing's syndrome	E24.4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mental and behavioural disorders due to use of alcohol	F10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Degeneration of nervous system due to alcohol	G31.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Alcoholic polyneuropathy	G62.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Alcoholic myopathy	G72.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Alcoholic cardiomyopathy	I42.6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Alcoholic gastritis	K29.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Chronic pancreatitis (alcohol induced)	K86.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ethanol poisoning	T51.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Methanol poisoning	T51.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Toxic effect of alcohol, unspecified	T51.9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Accidental poisoning by and exposure to alcohol	X45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	0.00	0.00	0.54	0.35	0.54	0.33	0.53	0.33	0.57	0.34	0.55	0.31	0.50	0.24	0.44	0.20
Malignant neoplasm of oesophagus	C15	0.00	0.00	0.35	0.20	0.35	0.18	0.34	0.18	0.38	0.18	0.36	0.17	0.31	0.13	0.26	0.10
Malignant neoplasm of larynx	C32	0.00	0.00	0.38	0.21	0.37	0.20	0.36	0.20	0.40	0.20	0.38	0.19	0.33	0.14	0.28	0.11
Malignant neoplasm of breast	C50	0.00	0.00	NA	0.13	NA	0.12	NA	0.12	NA	0.12	NA	0.11	NA	0.08	NA	0.07
Epilepsy and Status epilepticus	G40-G41	0.00	0.00	0.56	0.64	0.58	0.59	0.58	0.61	0.61	0.61	0.61	0.57	0.51	0.45	0.42	0.35
Hypertensive diseases	I10-I15	0.00	0.00	0.39	0.19	0.38	0.17	0.37	0.18	0.41	0.18	0.39	0.16	0.34	0.12	0.28	0.09
Cardiac arrhythmias	I47-I48	0.00	0.00	0.35	0.36	0.36	0.35	0.37	0.35	0.38	0.35	0.37	0.33	0.34	0.27	0.30	0.22
Haemorrhagic stroke	I60-I62, I69.0-I69.2	0.00	0.00	0.33	0.13	0.32	0.12	0.29	0.12	0.36	0.12	0.32	0.11	0.26	0.07	0.19	0.06
Oesophageal varices	I85	0.00	0.00	0.79	0.57	0.78	0.54	0.77	0.55	0.81	0.55	0.79	0.53	0.74	0.43	0.67	0.37
Gastro-oesophageal laceration-haemorrhage syndrome	K22.6	0.00	0.00	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Liver cirrhosis	K70, K74	0.00	0.00	0.79	0.57	0.78	0.54	0.77	0.55	0.81	0.55	0.79	0.53	0.74	0.43	0.67	0.37
Acute and chronic pancreatitis	K85, K86.1	0.00	0.00	0.32	0.16	0.31	0.14	0.31	0.14	0.34	0.15	0.32	0.13	0.28	0.09	0.23	0.07
Psoriasis	L40 excluding L405	0.00	0.00	0.34	0.33	0.34	0.33	0.35	0.33	0.36	0.32	0.35	0.31	0.33	0.26	0.30	0.22
Spontaneous abortion	O03	0.00	0.00	NA	0.23	NA	0.21	NA	0.22	NA	0.21	NA	0.20	NA	0.15	NA	0.12

Disease/Related health problem	ICD-10	Alcohol attributable fraction (%)															
		0-15		16-24		25-34		35-44		45-54		55-64		65-74		75+	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Road traffic accidents (driver/rider)	§	0.00	0.00	0.37	0.18	0.37	0.18	0.37	0.18	0.37	0.18	0.09	0	0.09	0	0.09	0
Pedestrian traffic accidents	§§	0.00	0.00	0.69	0.50	0.58	0.22	0.51	0.42	0.51	0.42	0.16	0.06	0.16	0.06	0.16	0.06
Water transport accidents	V90-V94	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Fall injuries	W00-W19	0.00	0.00	0.22	0.14	0.22	0.14	0.22	0.14	0.22	0.14	0.22	0.14	0.12	0.04	0.12	0.04
Firearm injuries	W32-W34	0.00	0.00	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Drowning	W65-W74	0.00	0.00	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Inhalation of gastric contents/Inhalation and ingestion of food causing obstruction of the respiratory tract	W78-W79	0.00	0.00	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Fire injuries	X00-X09	0.00	0.00	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Accidental excessive cold	X31	0.00	0.00	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Intentional self-harm/Event of undetermined intent	X60-X84, Y10-Y33	0.00	0.00	0.34	0.35	0.34	0.33	0.35	0.34	0.37	0.34	0.36	0.32	0.31	0.25	0.27	0.20
Assault	X85-Y09	0.00	0.00	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27

§ V12-V14 (.3 -.9), V19.4-V19.6, V19.9, V20-V28 (.3 -.9), V29-V79 (.4 -.9), V80.3-V80.5, V81.1, V82.1, V82.9, V83-V86 (.0 -.3), V87.0-V87.9, V89.2, V89.3, V89.9
§§ V02-V04 (.1, .9), V06.1, V09.2, V09.3

* These AAFs were generated in November 2007 for the calculation of the *Hospital admissions for alcohol-related harm* national indictors since the final AAFs in the current report were not available in time to incorporate into the indicator from the outset. See the technical guidance on the construction of the indicator for more details[9].

[9] Hospital admissions for alcohol-related harm: technical information and definition for National Indicator Set NI39, Vital Signs Indicator VSC26 and Public Service Agreement Indicator 25.2. www.nwph.net/alcohol/lape

Centre for Public Health
Faculty of Health and Applied Social Sciences
Liverpool John Moores University
Castle House
North Street
Liverpool
L3 2AY, UK
Tel: +44 (0)151 231 4511

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