



# The healthcare costs of harmful and hazardous alcohol consumption in older adults (2017/18)

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## Executive summary

In 2008/09 the healthcare cost associated with alcohol misuse in Northern Ireland was estimated at £122.2 million. Since then, the proportion of adults who drink has increased as has the number of hospital admissions for alcohol-related conditions, the number of individuals seeking help for alcohol-related problems and the number of deaths due to alcohol.

Using an approach similar to that used in previous studies, we have estimated the healthcare cost in Northern Ireland associated with alcohol misuse in 2018 at £125 million among those aged 50 and over. This is a conservative estimate based on the assumptions made in the study.

As our population ages and evidence of an unhealthy relationship among sections the public with alcohol accumulates, it is important that the public are aware of effects of alcohol at an individual and societal level. It is also important that appropriate policy responses to tackle the issue are developed.

## Background

Almost a decade ago, a report commissioned by the Department of Health, Social Services and Public safety (DHSSPS) in Northern Ireland quantified the social costs of alcohol misuse in Northern Ireland for 2008/09<sup>1</sup>. At that time, the cost to the health service in Northern Ireland of alcohol misuse was estimated at £122.2m (at 2008/09 prices).

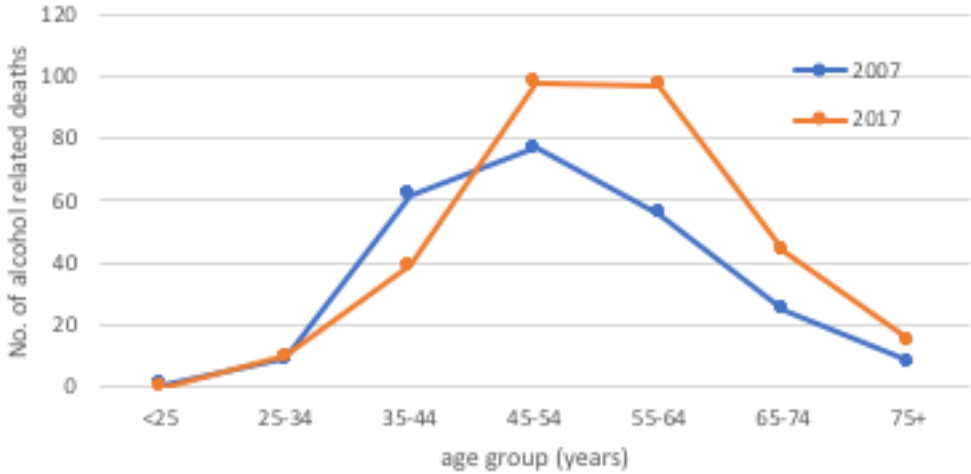
Since then in Northern Ireland, the proportion of adults who drink has increased, as have the number admissions for alcohol-related conditions, the number of individuals seeking help for alcohol-related problems and the number of deaths due to alcohol (New Strategic Direction for Alcohol and Drugs Phase 2 – Final Review, Oct 2018)<sup>2</sup>.

In 2017, the number of alcohol related deaths in Northern Ireland increased for the fourth consecutive year to the highest on record. The statistics show that 303 of the 16,036 deaths registered in Northern Ireland in 2017 were due to alcohol related causes. This is almost 30% more than was recorded a decade ago and 70% more than in 2001 (NISRA Press release, Alcohol related deaths reach highest on record, January 2019)<sup>3</sup>.

The largest number of alcohol related deaths in Northern Ireland continue to occur among those aged between 45 and 54 years, closely followed by those aged 55-64

years (Northern Ireland Statistics and Research Agency, NISRA) Figure 1. Northern Ireland is not alone in seeing a rise in alcohol-related morbidity and mortality among the over 50s - a similar pattern being observed in England, Wales, Scotland, and Ireland and indeed further afield in countries such as Australia and New Zealand<sup>4</sup>. However, there is evidence to indicate that unlike several of our nearest neighbours where among adults there is evidence of less alcohol misuse similar trends are less apparent in Northern Ireland<sup>5</sup>.

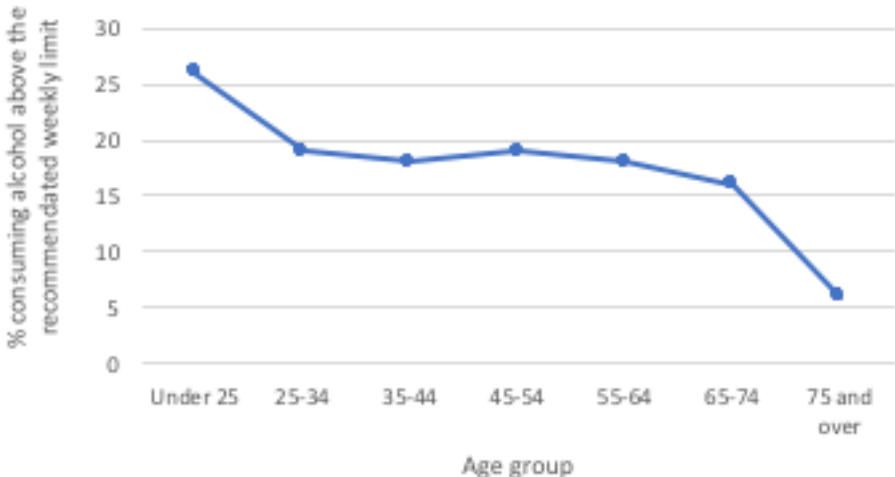
**Figure 1: Number of alcohol related deaths by age group in Northern Ireland (2007-2017).**



Source: based on data from NISRA

In 2017/18 in Northern Ireland, the percentage of adults exceeding the weekly recommended upper limits for alcohol consumption was as high in 45-64 year olds as for 25-44 year olds, exceeded only by those aged 18-24 years (Figure 2).

**Figure 2: Percentage of individuals who consumed alcohol above the weekly limit in NI in 2017/18**



As alcohol consumption (and age) increase so too does the risk of harm from a range of health conditions such as liver disease, a range of cancers and from injuries and accidents. At the extreme end consumption can result in dependence; alcohol dependence is a chronic and progressive condition associated with many adverse health consequences. Some conditions (such as alcoholic liver disease) are wholly alcohol related, while with other conditions such as coronary heart disease alcohol misuse has been linked to an elevation of risk of the condition; these can occur without alcohol dependence.

Given the aging profile of the population in Northern Ireland (and the UK in general), it is highly likely that the burden of illness borne by individuals and families arising from alcohol misuse will increase, as will the cost to the health and social care system.

In recent decades, much effort has been expended in the UK tackling the culture of youth and underage drinking. In Northern Ireland, the most recent major policy documents pertaining to alcohol misuse (New Strategic Direction for Alcohol and Drugs Phase 1 2006-2011 (Department of Health) and the National Strategic Direction for Alcohol and Drugs Phase 2 2011-2016 (Department of Health)), have prioritised the provision of treatment services for those who misuse alcohol and their families, carers and communities; increasing awareness about the negative consequences of alcohol consumption; equipping the workforce with skills to recognise and treat alcohol-related harm; and reducing alcohol consumption in people aged below 18 years through education activities<sup>2</sup>. However, alcohol issues affecting older people have not been specifically targeted in these policies.

The aim of this study is to estimate the alcohol-related healthcare costs in Northern Ireland among older adults – those aged 50 and over - for 2017/18 and in doing so help prompt a fuller discussion of the issues as they relate to older adults.

## **Approaches to estimating the costs of alcohol misuse**

In 2010, the World Health Organisation (WHO) produced a report entitled “Best practice in estimating the costs of alcohol – Recommendations for future studies”<sup>6</sup>. The aim of this report was to summarize best practice in estimating the attributable and avoidable costs of alcohol, and to provide guidance for the generation of such estimates in future studies.

In the report, it was noted that nearly all previous attributable and avoidable cost studies for alcohol have been carried out using the cost-of-illness (COI) framework developed in the United States by Dorothy Rice and colleagues<sup>7</sup>.

Three purposes for undertaking a study using a COI approach were outlined:

- To show that alcohol is a major social and economic problem;
- To compare the impact of different health and social problems; and
- To indicate which alcohol policies will reduce costs most

As the aim of this study was to estimate the alcohol related healthcare costs in older adults in Northern Ireland, a COI approach was deemed appropriate.

In the WHO report (2010), a section was devoted to best practice with respect to the calculation of alcohol related healthcare cost estimates. They noted that the most prevalent estimation method was to calculate alcohol attributable fractions (AAFs) for conditions either wholly or partially caused by alcohol (by combining epidemiological evidence for the risk of particular diseases at different levels of consumption). They recommended that, although it is possible to concentrate on only those conditions which are wholly attributable to alcohol (especially where data availability is an issue) that estimates should include where possible those conditions that are partially attributable to alcohol, so as not to substantially underestimate alcohol-related healthcare costs.

To treat health costs as a single aggregate figure, while highlighting the magnitude of the problem, would fail to demonstrate how the problem impacts differentially on different parts of the healthcare system. Hence, the impact of alcohol may differ across, for example, inpatient care, outpatient care, primary care, pharmaceuticals and ambulance services. The report noted the inherent challenges in trying to adapt AAFs to different cost categories, and concluded that it is rarely possible to achieve this. They also recommended that costs associated with treating alcohol disorders and research and prevention efforts should be captured, quantified and included in the estimate.

In producing our cost estimates (within the COI framework) two approaches have been adopted, with the approach taken depending on the data available:

- Estimating activity levels and applying Northern Ireland specific costs to these (e.g. acute hospital bed days for conditions either wholly or partially attributable to alcohol);  
or
- Estimating a relevant proportion of the total expenditure on a specific aspect of health service provision (e.g. the proportion of the Northern Ireland Ambulance Service expenditure on alcohol related ambulance and paramedic journeys).

In the absence of Northern Ireland specific data, a range of reasonable assumptions were made regarding, for example, the proportion of Accident and Emergency (A&E) attendances and GP visits that were alcohol related. A literature search was undertaken to identify relevant data sources from neighbouring jurisdictions and an assessment of the most appropriate data source to include was undertaken. Justification for the approaches adopted have been clearly elucidated in the report in the relevant sections.

For example, in some cases, it was more appropriate to use data from Scotland on the impact on service use (as opposed to England) as data on alcohol consumption patterns in Northern Ireland more closely resemble those in Scotland than those in England. Where multiple alternate data sources were available from which estimates could plausibly be extrapolated to Northern Ireland, these estimates were subjected to sensitivity analyses.

## Estimates of the costs of alcohol misuse in neighbouring jurisdictions

Estimates of the total societal costs of alcohol misuse have been produced for Northern Ireland in 2008/09<sup>1</sup>, Scotland<sup>8</sup>, England<sup>9</sup> and Wales<sup>10</sup> using a methodology similar to that which will be employed in this report, albeit that the scope of this report differs in that we are considering alcohol-related healthcare costs only for older adults (aged over 50 years).

In the UK, the most widely cited estimate of the cost of alcohol is based on a 2003 Cabinet Office Strategy Unit<sup>9</sup> report which estimated that alcohol generated external costs of £21bn a year in England and Wales, with a cost of £3.5bn to the NHS per year (at 2009/10 costs). A similar figure (of £3.2bn for public health and care services) was reported in a study by the National Social Marketing Centre in 2006/07 for England<sup>11</sup>.

The Scottish Government commissioned the University of York to estimate the costs of alcohol misuse in Scotland. They estimated that alcohol consumption was associated with a total cost of £3.6 bn in 2007<sup>8</sup>, including alcohol-related costs to the health service of between £143.6m and £392.8m. Unlike the Cabinet Office Strategy Unit report<sup>9</sup>, the alcohol-related costs of social care were included in this report (£114.2m-£346.8m), which were almost as high as health service costs. More recently (2012), a higher estimate of £7.2bn was estimated by researchers from the University of Aberdeen<sup>12</sup>.

As noted earlier, In Northern Ireland, the estimated social cost of alcohol misuse (in 2008/09) was £679.8m, with £122m being attributed to the provision of healthcare services.



## Categories of costs to be estimated in this COI study

In three of the aforementioned reports<sup>1,8,9</sup> there was consistency in the choice of cost elements to be included in the estimation of alcohol-related healthcare costs. In all three reports the greatest effort was expended in estimating hospitalisation costs (both acute and mental health), specifically identifying those conditions which were wholly or partially attributable to alcohol and attaching appropriate unit costs.

Other categories for which estimates were produced included A&E attendances, GP and nurse consultations, outpatient visits, GP prescribed drugs for alcohol dependence, and costs associated with specialised teams (such as community psychiatric teams and Drug and Alcohol Co-ordination Teams DACTs), day hospital visits (mental illness and non-mental illness), health promotion activities, and lab tests.

The approach to producing estimates did however vary between reports depending on the data available in each jurisdiction. For example, in the Cabinet Office Strategy Unit report (2003)<sup>9</sup> the alcohol-related cost of ambulance and paramedic journeys was estimated by using data from a MORI poll which indicated that 35% of ambulance journeys were alcohol-related. This information was combined with Ambulance Services in England statistics for 2006/7 to determine the number of journeys undertaken and a unit cost for an ambulance journey applied using Personal Social Services Research Unit (PSSRU) data<sup>13</sup> to produce a cost estimate. By contrast in Northern Ireland, operating costs for the Northern Ireland ambulance service (NIAS) were determined and an estimate relating to the percentage expenditure on alcohol related journeys was applied. It is important to bear these differences in mind when making comparison between jurisdictions.

## Data sources

Data selection is defined as the process of determining the appropriate data type and source and inevitably involves choices on the part of the researcher. These choices can impact on data integrity and ultimately the validity of the estimates produced. Here a hierarchical approach was adopted, whereby Northern Ireland specific data, sourced from Government Departments and Agencies were used where available, and where necessary supplemented with data held but not routinely published from NI sources.

Where no data (or only partial data) were available, assumptions based on the best available evidence from neighbouring jurisdictions was applied. A rigorous appraisal process was employed to ensure that the assumptions made were reasonable and that data sources used were comparable in so far as was possible, or adjusted (in a transparent way) to reflect the Northern Ireland context. Where assumptions were applied, they have been clearly and transparently recorded, and uncertainty in base case estimates have been explored using sensitivity analyses.

## Quantifying uncertainty in the cost estimates

To reflect uncertainty in our cost estimates where assumptions were based on patterns reported in other jurisdictions, the cost estimates were categorised as either 'firm' or 'outline' estimates. The same approach was used in estimating the social cost of alcohol-related misuse in Northern Ireland in 2008/09<sup>1</sup>.

An estimate was categorised as 'firm' if we were able to obtain robust, recent Northern Ireland specific data from Government Departments or Agencies. An estimate was categorised as 'outline' if the estimate was subject to greater uncertainty (for example, when percentages attributable to alcohol were applied using data from England or Scotland).

For each of the estimates we present a base case estimate, representing the firm or outline estimate as calculated (as outlined above). We then present the results of sensitivity analyses, where the estimate is varied around this base case value based on alternative assumptions regarding the magnitude of the parameter value about which there is uncertainty. In all cases the source and degree of uncertainty of the base case estimate has been clearly outlined (and the source of the data referenced). For base case estimates categorised as 'firm', the estimate was varied by an arbitrary +/-10% in the analysis. For estimates categorised as 'outline', the base case estimate was varied by a larger amount reflecting greater uncertainty (i.e +/-25% around the base-case

estimate). In general, the upper and lower estimates have been derived from a review of the literature and data available.

## Comparability of adult drinking patterns in Northern Ireland with neighbouring jurisdictions

In constructing assumptions based on data from other jurisdictions, it was necessary to explore the patterns observed compared to Northern Ireland with respect to the quantity and frequency of alcohol consumption and also drinking patterns.

In its report *Adult drinking habits in Great Britain:2017* the Office of National Statistics estimate that in England, Wales, and Scotland respectively 57.8%, 50%, and 53.5% of adults drank in the previous week. Comparable figures for Northern Ireland produced by the Department of Health for 2013 indicate that approximately 53 of adults drank in the previous week. With respect to patterns of drinking by age group while in Britain there has been an increase in abstinence among those aged 45-64 between 2005 and 2017 and a fall in abstinence among those aged 65 and over, in Northern Ireland there has been a rise in abstinence among those aged under 54 but a fall in abstinence among all older age groups. Comparisons of hazardous drinking are complicated by the lack of comparable statistics between jurisdictions over time. However, in Northern Ireland it is noted that while the percentage of those aged 45-54 and those aged 55-64 that exceeded Chief Medical Officer's guidelines fell by roughly 5 percentage points between 2010/11 and 2017/18; among those aged 65-74 it actually increased by 2 percentage points (remaining relatively constant among those aged 75 and over. We return to this issue in the discussion.

<sup>1</sup> <file:///C:/Users/3041840/Downloads/Adult%20drinking%20habits%20in%20Great%20Britain%202017.pdf>

<sup>2</sup> <https://www.health-ni.gov.uk/sites/default/files/publications/dhssps/adps-2013.pdf>

# Adjustment of cost estimates

## Adjustment of cost estimates to reflect differences in consumption patterns between jurisdictions

In the previous estimate of healthcare costs associated with alcohol misuse in Northern Ireland (20018/09),<sup>1</sup> estimates derived from Scottish data were adjusted downwards by a notional amount of 10% to reflect differences in consumption patterns between Scotland and Northern Ireland. In this report we have used conservative estimates throughout and explore uncertainty using sensitivity analysis.

## Adjustment of cost estimates to reflect concurrent use of drugs and alcohol

In the census of drug and alcohol treatment services in Northern Ireland 2017 published by DOH statistics and research<sup>14</sup>, it was clear that in the decade since the last estimate of the impact of alcohol misuse on the healthcare system that the incidence of concurrent alcohol and drug misuse has increased.

Disentangling the effects of alcohol from those of drugs in combined alcohol and drug misuse is challenging. As the focus of this report was solely that of alcohol, we have not sought to include that element of cost that is attributable to the alcohol element of drug and alcohol use. In this respect, our estimates can be viewed as conservative in respect of the impact of alcohol use on the health service.

## Adjustment of cost estimates to reflect health benefits of alcohol consumption

It is acknowledged that light to moderate consumption of alcohol may have some health benefits, especially with respect to conditions such as heart disease and stroke, though this is debated. However, as this evidence is mixed we have not sought to estimate potential savings to the health service that might be associated with light or moderate alcohol consumption. While our estimates might be viewed as biased as a result this can be viewed as a cautious approach that might best be pursued in further research.

## Age adjustment of cost estimates

Age and gender specific data were available for alcohol attributable hospitalisations in Northern Ireland. No such data was available on the proportion of other alcohol attributable healthcare services use by the over 50s in Northern Ireland. Hence, we applied an age and gender specific alcohol attributable hospital morbidity statistics (Scottish data for 2015), hence we have assumed that a similar distribution of healthcare utilisation is observed in all areas of healthcare as seen in secondary care. The impact of this assumption was explored using sensitivity analysis.

# Cost analysis – Alcohol related cost elements in healthcare

## 1. The costs of alcohol related hospital attendances (acute)

### Description

An important element of the overall healthcare cost of alcohol misuse in Northern Ireland is the cost of hospital attendances (acute) associated with conditions either wholly or partly attributable to alcohol. In previous studies, alcohol related inpatient stays have made up the largest portion of healthcare costs in England<sup>9</sup>, Scotland<sup>8</sup> and Northern Ireland<sup>1</sup>.

### Methodology for calculation

Within a hospital setting, The International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10)<sup>15</sup> is used for coding of diseases and signs, symptoms, abnormal findings, complaints, social circumstances and external causes of injury or diseases, as classified by the World Health Organization (WHO). For each ICD-10 code, it is possible to identify which conditions are either wholly or partially attributable to alcohol, and determine the number of hospital attendances (acute) which occurred over the period of interest.

In order to determine the total cost of hospital attendances (acute) it is next necessary to attach a cost to each hospital attendance. Once costs have been applied, it is necessary to determine what proportion of hospital attendances (within that condition – using ICD-10 codes) were attributable to alcohol i.e. to apply an alcohol attributable fraction (AAF).

Estimated AAFs range between zero and one, with conditions where alcohol is the sole cause having an AAF of 1.0 (or 100%) - such conditions are known as alcohol-specific or wholly alcohol-attributable conditions. Over twenty conditions (using ICD-10 codes) have been identified as being wholly attributable to alcohol misuse, with conditions such as mental and behavioural disorders due to use of alcohol, alcoholic liver disease and ethanol poisoning being the most common.

For conditions where alcohol has a proven relationship, but it is one of a range of causative factors, an estimate of the contribution alcohol makes is calculated. For

example, it has been estimated that alcohol plays a causative role in between 25-33 per cent of cardiac arrhythmias. Such conditions are therefore considered partially alcohol-attributable conditions and the associated AAF would be 0.25-0.33. Over twenty more conditions have been categorised as partially attributable chronic conditions (such as neoplasms of the oesophagus, lips and pharynx, hypertensive disease and cardiac arrhythmias), and a range of injuries are considered partially attributable injuries (ranging from road traffic accidents, fall injuries and poisoning).

AAFs differ somewhat for men and women and by age and ethnicity. A full list of wholly and partially attributable conditions used in this report are presented in Appendix 1.

Hence, it was necessary to identify the following information:

- The number of hospital attendances for conditions either wholly or partially attributable to alcohol (using ICD-10 codes) for those aged 50 years or greater in Northern Ireland for 2017/18;
- A cost for hospital attendances which were either wholly or partially attributable to alcohol (using ICD-10 codes) for those aged 50 years or greater in Northern Ireland for 2017/18; and
- The AAF to apply to hospital attendances in conditions which were either wholly or partially attributable to alcohol (using ICD-10 codes) for those 50 years of age or greater for 2017/18.

## Data sources used

The appropriate data was supplied by the Hospital Information Branch, Information & Analysis Directorate, Department of Health NI, using data from the Hospital Inpatient System 2017/18 and NI Reference costs 2016/17 (with a 2.1% uplift applied for 2017/18).

Two separate measurements were calculated for admission costs relating to alcohol to HSC hospitals in Northern Ireland for those aged 50 years and over. Admissions within the Mental Health Programme of Care, nurse-led activity and excess bed days were not included in the costs hence the estimates provided are conservative.

Using the **narrow measure of costs** (based on primary diagnostic field only and using the attributable fractions used for England<sup>16</sup>) admissions to acute hospitals in Northern Ireland, where there was an alcohol related diagnosis cost **approximately £11.5 million** (based on 2016/17 reference costs with a 2.1% uplift applied for 2017/18). This narrow measure is defined as a measure of hospital admissions where the primary diagnosis (main reason for admission) is an alcohol-related condition; since every hospital admission must have a primary diagnosis it is less sensitive to coding practices but may understate the part alcohol plays in the admission.

Using the **broad measure of costs** (based on all diagnostic fields and using the attributable fractions used for England<sup>16</sup>) admissions to acute hospitals in Northern Ireland cost **approximately £68 million** (based on 2016/17 reference costs with a 2.1% uplift applied for 2017/18). In general, the broad measure gives an indication of the full

impact of alcohol on hospital admissions and the burden placed on the NHS, whereas the narrow measure estimates the number of hospital admissions which are primarily due to alcohol consumption and provides the best indication of trends in alcohol-related hospital admissions.

Where low levels of alcohol consumption may have a protective effect, a negative AAF is available e.g. for diabetes mellitus type II. Outcomes where alcohol may have a protective effect are not included when the AAFs are applied to the costs i.e. there are no 'negative costs' applied.

### **Stratification and sensitivity analysis**

This estimate was categorised as **outline** as although based on Northern Ireland data, the AAFs which were applied to this data were taken from an English population and an age adjustment factor applied. Applying +/-25% around the base case estimate produces a range from a lower value of **£51m** to a higher value of **£85m**.

## **2 The costs of alcohol related Accident & Emergency (A&E) attendances**

### **Description**

Alcohol-related visits to A&E departments also impose a cost on the health service.

### **Methodology for calculation**

The Information and Analysis Directorate, DOH, Northern Ireland, does not currently collect information on the number of A&E attendances which are wholly or partially attributable to alcohol [personal correspondence from the Information and Analysis Directorate].

Hence, it was necessary to identify the following information:

- The number of A&E attendances in Northern Ireland in 2017/18;
- The cost of an A&E attendance in Northern Ireland in 2017/18; and
- The proportion of A&E attendances that were attributable to alcohol in 2017/18.

## Data sources used

### Data on the number of alcohol related A&E attendances

The number of A&E attendances was available from published information from the Hospital Inpatient System (Hospital Information Branch, Information & Analysis Directorate, DOH, Northern Ireland).

### Data on the cost per A&E attendance

The NHS reference cost 2017/18 of an A&E attendance was applied.

### Data on the proportion of A&E attendances that were attributable to alcohol

A literature search revealed no recent studies which identified the alcohol attributable proportion of A&E attendances in Northern Ireland. In 2009, a study undertaken at Altnagelvin Hospital<sup>1</sup> suggested that one third of all A&E attendances had a direct link to alcohol, and many more were partly related to alcohol (e.g. people attending A&E after road accidents may be innocent sober victims of drunk drivers); around 40% of admissions were as a consequence of alcohol misuse (e.g. acute pancreatitis, falls, seizures). A more recent study undertaken by the Institute of Alcohol Studies in 2015<sup>17</sup> entitled 'Alcohol's impact on the emergency services' estimated that 25% of emergency department consultants time was spent dealing with alcohol-related incidents, with figures of up to 40% being reported and as high as 70% at peak times.

## Estimate of alcohol-related cost

In 2017/18 there were 823,236 new and unplanned review attendances at A&E departments in Northern Ireland<sup>18</sup>. Based on the DOH, NI published cost data and the NHS reference cost of an A&E attendance in combination with the conservative assumptions regarding the proportion of A&E visits which are alcohol related we estimate the cost of A&E attendances relating to alcohol misuse in NI in 2017/18 was in the region of £32.9m per annum, resulting in an estimate of **£21.2m** when the age adjustment factor was applied (Table 1).



**Table 1: A&E attendances**

	2017/18	2007/08
Total A&E attendances in Northern Ireland	823,236	732,022
Estimated proportion relating to alcohol	25%	25%
Estimated A&E attendances relating to alcohol	205,809	183,006
Cost per A&E attendance	£160	£98
<b>Total cost</b>	<b>£32,929,440</b>	<b>£17.9m</b> (£18.4 uplifted to 2008/09 prices)
<b>Total cost (individuals over 50yrs)</b>	<b>£21,226,317</b>	

### Stratification and sensitivity analysis

Our estimate of alcohol-related A&E attendance costs has been categorised as outline since it incorporates assumptions on the proportion of total A&E attendances attributable to alcohol, and the application of an age adjustment factor. Applying +/- 25% around the base case estimate produces a range from a lower value of **£15.9m** to a higher value of **£26.5m**.

## 3. The costs of alcohol dependency GP prescribed drugs

### Description

Alcohol dependency can be treated with a number of drugs. Acamprosate (also known as Campral) is prescribed to post-abstinence patients to reduce alcohol cravings, Disulfiram (also known as Antabuse) is prescribed to create a physical aversion to alcohol use, and Nalmefene (introduced in May 2013) works by blocking the opioid receptors in the body, stopping the effects of alcohol and reducing demand as a result.

## Methodology for calculation

Similar to previous studies undertaken in Scotland and England, we sought to identify the net ingredient cost of GP prescribed drugs used to treat alcohol dependency as these drugs represent an element of the healthcare costs of alcohol misuse. In line with previous analyses<sup>1,9</sup>, and for consistency with other UK studies in this field, we have taken account of drug ingredient costs but excluded any additional dispensing costs incurred by pharmacists.

## Data sources used

### Data on the net ingredient cost of GP prescribed drugs for alcohol dependency

Published data supplied by HSC Business Services Organisation (BSO) Northern Ireland on GP prescribing of drugs to treat alcohol dependency was used<sup>19</sup>. Expenditure in 2017/18 on Acamprosate was £328,126, with a further £158,227 spent on Disulfiram, and £19,975 on Nalmefene, giving a total expenditure of £506,328 (Table 2).

**Table 2: Cost of GP Prescribed drugs used to treat alcohol dependency in NI (2018)**

2017/18	2017/18	2007/08	2007/08	
Jan	27,800	14,161	1,261	
Feb	25,054	11,152	1,609	
Mar	27,263	13,619	1,414	
April	25,543	11,598	2,187	
May	29,344	14,555	1,432	
June	28,951	13,966	1,835	
July	27,094	14,985	1,530	
August	28,171	12,763	1,910	
September	26,786	11,903	1,942	
October	27,769	13,791	1,411	
November	26,718	13,320	1,682	
December	27,633	12,414	1,762	
Jan	27,800	14,161	1,261	
Feb	25,054	11,152	1,609	<b>Total drug cost</b>
Mar	27,263	13,619	1,414	
<b>Total</b>	27,263	13,619	1,414	<b>£506,328</b>

Source: <https://www.opendatani.gov.uk/dataset/gp-prescribing-data>

## Estimate of alcohol-related cost

The estimate for GP prescribed drugs for the maintenance and management of alcohol cravings in Northern Ireland in 2017/18 was £506,328. Applying the age distribution adjustment (to create an estimate for those over 50 years only), the base case estimate for GP prescribed drugs for alcohol withdrawal symptoms in Northern Ireland in 2017/18 for those over 50 years was **£326,379**.

## Stratification and sensitivity analysis

This estimate is supported by Northern Ireland specific data (HSC Business Services Organisation (BSO) Northern Ireland for prescribing data and Northern Ireland specific data on the age distribution of alcohol consumption) and hence this estimate has been stratified as **firm**. The base case estimate was varied by an arbitrary +/-10% in our sensitivity analysis to account for uncertainty. This produced a lower estimate of **£293,741** and an upper estimate of **£359,017**.

It is important to stress that drugs partially related to alcohol use are excluded from this calculation. This includes opioids, antidepressants and anxiolytics that are often consumed by those with substance misuse issues and that are heavily prescribed in Northern Ireland, hence this is a conservative estimate.

## 4. The cost of alcohol related GP and practice nurse consultations

### Description

As well as the cost of drugs used in treating alcohol dependency, it is necessary to consider the costs associated with diagnosing or discussing alcohol-related health problems and the associated costs around prescribing and monitoring their use, both by the GP and practice nurses.

### Methodology for calculation

We sought information from the HSC Business Services Organisation (BSO) Northern Ireland on the number of GP and practice nurse consultations which were categorised as being either wholly and partly attributable to alcohol in Northern Ireland. However, we understand the BSO does not gather or collate information of this nature.

In the absence of data on such consultations it was necessary to identify an alternative strategy to secure a reasonable estimate of this cost. In the publication 'Social costs of Alcohol Misuse in Northern Ireland 2008/09'<sup>1</sup>, the estimate used the relationship

between GP prescribed drugs for alcohol dependence and data on the number of GP and Nurse consultations which was available in England and Scotland at that time. The ratio of GP prescribed drugs to GP/nurse consultations varied significantly between jurisdictions (a ratio of 17:1 in Scotland and 52:1 in England, resulting in a base case estimate which used the mid-point of 34.5 (i.e. the cost estimate of GP/practice nurse consultations being 34.5 times the cost of GP prescribed drugs). The sensitivity analysis used the lower estimate from England and upper estimate from Scotland, resulting in a high level of variability around this estimate.

To increase the comparability of our estimates with those produced in other jurisdictions we followed this approach here.

## Data sources used

### Data on the cost of GP prescribed drugs for alcohol dependency

In the preceding section of this report 'The cost of alcohol attributable GP prescribed drugs', using Northern Ireland specific data supplied by HSC Business Services Organisation (BSO) we estimated that the cost of GP prescribed drugs for alcohol dependency was £326,379 for those over the age of 50 years.

### Data on the ratio of the cost of GP prescribed drugs for alcohol dependency and GP and nurse consultations in neighbouring jurisdictions

No recent information could be identified to update the ratio of GP prescribed drugs to GP and Nurse attendances hence the previously used ratio of 34.5:1 was used and subjected to sensitivity analysis.

### Estimate of alcohol-related cost

Applying a ratio of 34.5:1 to the cost estimate of GP prescribed drugs for alcohol dependency (as calculated in the previous section) resulted in an age-adjusted cost estimate for alcohol attributable GP and Nurse consultations of **£11.3m**

### Stratification and sensitivity analysis

Our estimate of alcohol-related GP and practice nurse consultation costs has been categorised as **outline** since it incorporates assumptions regarding the ratio of GP prescribed drugs for alcohol dependence, and the application of an age adjustment factor. The lower estimate of alcohol attributable GP and nurse consultations in Northern Ireland in 2017/18 for the over 50s was **£8.4m**; the upper estimate was **£14.1m**.

## 5. The costs of alcohol related emergency ambulance and paramedic journeys

### Description

Alcohol related emergency ambulance and paramedic journeys generate additional expenditure within the health service in Northern Ireland. Common reasons for paramedics and ambulance staff to be called to alcohol-related incidents include assaults and injuries, drink drive accidents, domestic violence, people experiencing seizures or fits, unconsciousness, overdoses, self-harm, as well as reports of people being 'generally unwell'.

### Methodology for calculation

Data on the number of alcohol related ambulance journeys are not routinely collected in Northern Ireland (personal communication Information & Analysis Directorate, DOH, Northern Ireland). In the absence of such data it was necessary to construct an estimate using published data on the proportion ambulance journeys which were alcohol-related in combination with NIAS operating costs.

Hence it was necessary to identify the following information:

- NIAS operating costs for 2017/18; and
- Recent data on the proportion of ambulance journeys which are thought to be alcohol-related for 2017/18

### Data sources used

#### **Data on the operating costs of NIAS:**

Published data on the NI ambulance service operating costs was available from the NIAS Annual Report. Operating costs in 2017 were £72,361,000 and in 2018 were £77,505,000.

#### **Data on the proportion of ambulance and paramedic journeys which are alcohol related:**

The Institute of Alcohol Studies (IAS) report 'Alcohol's impact on emergency services' (2015)<sup>21</sup> estimated that 37% of ambulance time was spent dealing with alcohol-related incidents. Previously, government figures in 2009/10 estimated that there were 1.4 million alcohol related ambulance and paramedic journeys in England, which accounted for 35% of emergency journeys<sup>22</sup>. The Scottish Ambulance Service has calculated that it is called out to deal with an intoxicated patient every 21 minutes, highlighting the burden alcohol related incidents place on Ambulance Services<sup>23</sup>.

## Estimate of alcohol-related cost

NIAS operating costs for 2017/18 were used and it was assumed 35% of journeys were alcohol related. This figure was age adjusted to give a base case estimate of alcohol attributable ambulance and paramedic journey costs in Northern Ireland in 2017/18 for those over 50 of **£16.9m**.

## Stratification and sensitivity analysis

Our estimate of alcohol-attributable ambulance and paramedic journeys in Northern Ireland has been categorised as **outline** as it incorporates assumptions (based on best current evidence) on the proportion of ambulance and paramedic journeys attributable to alcohol, and the application of an age adjustment factor. The lower estimate of alcohol attributable ambulance and paramedic journeys in Northern Ireland in 2017/18 for the over 50s was **£12.7m**; the upper estimate was **£21.1m**.

# 6. The costs of alcohol related outpatient visits

## Description

Given the substantial cost of alcohol-related inpatient stays, it should be expected that some of those admissions would also result in subsequent outpatient appointments, for example with respect to patients with mental illness and other conditions.

## Methodology for calculation

Data on the number of alcohol related outpatient visits are not routinely collected in Northern Ireland (personal communication Information & Analysis Directorate, DOH, Northern Ireland). In the absence of such data it was necessary to construct an estimate using published data on the number of outpatient attendances in Northern Ireland in 2017/18 combined with the best available evidence regarding the proportion of such attendances which can reasonably be attributed to alcohol misuse.

Hence, it was necessary to identify the following information:

- The number (and cost) of alcohol related outpatient visits in Northern Ireland 2017/18
- The proportion of out-patient visits which are alcohol-related

## Data sources used

### Data on the number of alcohol-related outpatient visits

Data on the number of outpatient attendances in Northern Ireland in 2017/18 were available from published sources [Hospital Statistics Outpatient Activity Statistics 2017/18]. There were 466,823 new attendances and 989,828 review attendances resulting in a total of 1,456,651 outpatient attendances. The NHS reference cost (2017/18) for an outpatient attendance (£125/attendance) was applied.

### Data on the proportion of outpatient visits which are alcohol related

In the Northern Ireland report on the social cost of alcohol misuse 2008/09 it was suggested that 2.4% of outpatient attendances were alcohol-related. No more recent estimates could be discerned from the literature.

## Estimate of alcohol-related cost

Assuming that 2.4% of outpatient attendances were alcohol related (after adjusting for age and applying Northern Ireland specific unit costs for outpatient attendances) resulted in a base case estimate of **£2.8m**.

## Stratification and sensitivity analysis

This estimate was considered as **outline**, hence the base case value was varied by an arbitrary +/-25% in our sensitivity analysis to account for uncertainty. This produced a lower estimate of **£2.1m** and an upper estimate of **£3.5**.

## 7. The costs of alcohol related drug and alcohol coordination teams (DACTs) and other government initiatives

### Description

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

### Methodology for calculation

The methodological approach adopted was to apportion funding which has been made available for drugs and alcohol and determine what proportion was alcohol related and then adjust to get a cost for those over 50 years.

### Data sources used

#### **Data on the cost of DACTs and other alcohol related government initiatives in Northern Ireland in 2017/18**

New Strategic Direction for Alcohol and Drugs Phase 2 Final Review, it was stated that government had invested £16m on drug and alcohol related initiatives, using data from the Census of drug and alcohol treatment services in Northern Ireland (March 2017)<sup>14</sup> it was possible to estimate what proportion of this funding was attributable to alcohol (Table 3).



**Table 3. proportion of services dealing with Alcohol only, alcohol and drugs and drugs only**

Gender	Alcohol Only	Drugs Only	Drugs & Alcohol	Total
<b>Total</b>	<b>2,577</b>	<b>2,036</b>	<b>1,356</b>	<b>5,969</b>
Male	1,567	1,496	1,032	4,095
Female	1,010	540	324	1,874
Male (%)	60.8	73.5	76.1	68.6
Female (%)	39.2	26.5	23.9	31.4
<b>% of Total</b>	<b>43.2</b>	<b>34.1</b>	<b>22.7</b>	<b>100.0</b>
% of all Males	38.3	36.5	25.2	100.0
% of all Females	53.9	28.8	17.3	100.0

Source: Census of drug and alcohol treatment services in Northern Ireland, March 2017, Information Analysis Directorate. [Source: <https://www.health-ni.gov.uk/sites/default/files/publications/health/drug-alcohol-census-2017.pdf>]

### Estimate of alcohol-related cost

Applying the above information to government funding for drug and alcohol programmes and applying an age adjustment factor to account for those over 50 years of age accessing such services resulted in a base case estimate of **£4.5m**. This is a conservative cost estimate as it did not take into account those accessing services for drugs and alcohol, but only those accessing services for alcohol.

This estimate was considered **outline**, hence the base case value was varied by an arbitrary +/-25% in our sensitivity analysis to account for uncertainty. This produced a lower estimate of **£3.3m** and an upper estimate of **£5.6m**.

## 8. The cost of other alcohol-related healthcare usage

In previous analyses of alcohol-attributable healthcare costs some additional cost categories have been included (e.g. cost of lab tests, hospital day visits etc), however, in light of the relatively small contribution they made to the overall cost it was out with the remit of this report to estimate these additional cost categories.

### Summary of findings

Table 4 outlines the elements of cost which were used to produce the estimate of alcohol attributable healthcare costs in Northern Ireland in the over 50's. The source of the contributory cost estimate has been provided, the estimate categorised as firm or outline (using the methodology explained above) and a base case, lower and upper estimate for 2017/18 are presented for each cost element.

**Table 4: Summary of cost estimates**

ANNUAL COST ESTIMATE				
Cost element	Categorisation of estimate (firm/outline)	Base case estimate £m	Lower estimate £m	Upper estimate £m
Hospitalisation days (acute)	Outline +/-25%	68	51	85
A&E attendances	Outline +/-25%	21.2	15.9	26.5
GP/practice nurse consultations	Outline +/-25%	11.3	8.4	14.1
Ambulance service	Outline +/-25%	16.9	12.7	21.1
Outpatient hospital visits	Outline +/-25%	2.8	2.1	3.5
DACT and other government initiatives	Outline +/-25%	4.5	3.3	5.6
GP prescribed drugs	Firm +/-25%	0.326	0.294	0.359
<b>Total</b>		<b>125</b>	<b>93.8</b>	<b>156.2</b>

As a base case, we estimate that alcohol misuse in the over 50's resulted in healthcare costs of **£125m** in Northern Ireland in 2017/18, with a lower estimate of **£93.8m** and an upper estimate of **£156.2m**.

The estimates in this report are for the tangible costs of problem alcohol use and are an underestimate insofar as sufficient data is not available in Northern Ireland to calculate some of the costs, for example, in prescriptions of antidepressants etc. that may be more likely among those who misuse alcohol. Similarly, in as much as we ignore the indirect effects of alcohol, for example, the impact of alcohol misuse on the health and healthcare use of other family members or earlier/inappropriate admission to care homes because of alcohol related brain damage our estimates can be judged as conservative. (With respect to alcohol related brain damage – the majority of which is experienced among older adults - the estimated nursing and home cost alone was estimated at **£1.2 million** in Northern Ireland in 2015/16 ). Also excluded are the production losses and intangible costs related to lower health related quality of life included in estimates from some other countries.

<sup>3</sup> [https://www.rcpsych.ac.uk/docs/default-source/improving-care/better-mh-policy/college-reports/college-report-cr2121829213d17e3461785bcb073c1529334.pdf?sfvrsn=3924e027\\_2](https://www.rcpsych.ac.uk/docs/default-source/improving-care/better-mh-policy/college-reports/college-report-cr2121829213d17e3461785bcb073c1529334.pdf?sfvrsn=3924e027_2)

# Discussion

In brief our study found that the cost to the health service in Northern Ireland of alcohol use among those aged 50 and over was approximately **£125 million** in 2017/18. This was distributed unevenly across services reflecting differential patterns of service use and investment. For example, while roughly 9% was comprised of primary care use, roughly 54% was comprised of acute hospital use, 14% related to ambulance service use and 17% to A&E service use. Just 0.3% was related to medicines prescribed specifically to those seeking to address alcohol addiction and roughly 4% on alcohol prevention and treatment programmes.

Care is warranted in the interpretation of these figures. As noted in the methods and results section it must be stressed that these are conservative estimates, excluding for example the impact on the health service of alcohol use that is concurrent with drug abuse; costs that are likely to be significant. Similarly, that we excluded instances where consumption could not confidently be attributed to alcohol use – for example, additional use of prescribed antidepressants, anxiolytics or opioids – as well as healthcare use by other family members that may arise as a result of the use by others, again suggests that our estimates should be treated as conservative. The same caveat applies to our estimates of the distribution of those costs.

There exists a body of literature pointing to the existence of distinct patterns of alcohol consumption across sub-populations defined by age across a range of countries<sup>24</sup>. That the burden of alcohol consumption should vary by age group is therefore unsurprising. In Northern Ireland as with the rest of the UK, alcohol-related deaths are higher among those aged over 50 and in Northern Ireland age-standardized alcohol specific death rates have risen sharply since 2013 from 12.2 per 100,000 to 17.4 per 100,000 in 2017<sup>25</sup>. Within this context it is understandable, especially given our ageing population that concern regarding alcohol consumption among older adults should have increased. Our estimates of the burden to the health service related to alcohol use among those aged 50 and over will add to the discussion on these issues.

In Northern Ireland, results from the NICOLA study on drinking patterns among those aged 50 and above indicate that roughly 61% consume alcohol (higher than the estimates produced in other Northern Ireland surveys). Of this approximately 29% would be considered to be hazardous drinkers (based on consumption in excess of the recommend level of 14 units per week) and roughly 7% would be considered binge drinkers. These figures further suggest that there are grounds to suspect that the relationship of some older adults with alcohol warrants a fuller examination and consideration of policy responses.

In Northern Ireland and other jurisdictions policy responses to alcohol use in general include the provision of support to those wishing to address alcohol dependence and raising awareness of the dangers of alcohol consumption. In Scotland following a series of legal battles minimum unit pricing was introduced in May 2018. Researchers have

suggested that this will result in 120 fewer alcohol attributable deaths, 1200 fewer hospital admissions and a saving of £12.1 million to the Scottish NHS each year<sup>26</sup> (though the estimated benefits relates to all age groups and not simply those aged over 50). In Wales, similar legislation was passed in 2018 and in Northern Ireland there have been calls for its adoption also. In Northern Ireland such legislation is likely to require the restoration of the local Assembly. While we await this, our study suggests that there exists a clear argument for greater investment in public health measures to address unhealthy drinking habits generally and among those aged over 50 in particular. Further research examining the cost-effectiveness of such interventions could usefully assess their value for money.

## Conclusions

The health effects of excessive alcohol consumption are well documented in terms of morbidity and mortality. Previous studies have demonstrated at a population level the significant impact on the healthcare systems across the UK of alcohol consumption.

In our analyses we have followed the approach of previous UK studies in so far as is possible to estimate the burden on our health service of alcohol consumption among those aged 50 and over. While the absence of Northern Ireland specific data has in places – for example in respect of alcohol specific A&E or ambulance use - required assumptions to be made on occasion, we have endeavoured to use the best estimates available based on neighbouring jurisdictions and undertaken sensitivity analyses to address uncertainty in estimates.

We estimate the cost to be in the order of £125 million per year an estimate we consider to be conservative.

## Appendix 1:

### Conditions wholly and partially attributable to alcohol consumption - Condition ICD-10 code(s)

#### Wholly attributable conditions

Accidental poisoning by and exposure to alcohol X45

Alcohol-induced acute pancreatitis K85.2

Alcohol-induced chronic pancreatitis K86.0

Alcohol-induced pseudo-Cushing's syndrome E24.4

Alcoholic cardiomyopathy I42.6

Alcoholic gastritis K29.2

Alcoholic liver disease K70

Alcoholic myopathy G72.1

Alcoholic polyneuropathy G62.1

Degeneration of nervous system due to alcohol G31.2

Ethanol poisoning T51.0

Evidence of alcohol involvement determined by blood alcohol level Y90

Evidence of alcohol involvement determined by level of intoxication Y91

Excess alcohol blood levels R78.0

Fetal alcohol syndrome (dysmorphic) Q86.0

Intentional self-poisoning by and exposure to alcohol X65

Mental and behavioural disorders due to use of alcohol F10b

Methanol poisoning T51.1

Poisoning by and exposure to alcohol, undetermined intent Y15

Toxic effect of alcohol, unspecified T51.9

## Partially attributable chronic conditions

Infectious and parasitic diseases

Tuberculosis A15–A19

Malignant neoplasms Breast C50

Colorectal C18–C20

Larynx C32

Lip, oral cavity and pharynx C00–C14

Liver and intrahepatic bile ducts C22

Oesophagus C15

Diabetes mellitus

Diabetes mellitus (type 2) E11

Diseases of the nervous system

Epilepsy and status epilepticus G40–G41

Cardiovascular disease

Cardiac arrhythmias I47–I48

Haemorrhagic stroke I60–I62, I69.0–I69.2

Hypertensive diseases I10–I15

Ischaemic/coronary heart disease I20–I25

Ischaemic stroke I63–I66, I69.3–I69.4

Respiratory infections

Pneumonia J10.0, J11.0, J12–J15, J18

Digestive disease Acute and chronic pancreatitis K85, K86.1

Cholelithiasis (gallstones) K80

Oesophageal varices I85

Unspecified liver disease K73, K74

## Partially attributable acute condition

Unintentional injuries Drowning W65–W74

Fall injuries W00–W19

Fire injuries X00–X09

Road/pedestrian traffic accidents V021–V029, V031–V039, V041–V049, V092, V093, V123–V129, V133–V139, V143–V149, V194–V196, V203–V209, V213–V219, V223–V229, V233–V239, V243–V249, V253–V259, V263–V269, V273–V279, V283–V289, V294–V299, V304–V309, V314–V319, V324–V329, V334–V339, V344–V349, V354–V359, V364–V369, V374–V379, V384–V389, V394–V399, V404–V409, V414–V419, V424–V429, V434–V439, V444–V449, V454–V459, V464–V469, V474–V479, V484–V489, V494–V499, V504–V509, V514–V519, V524–V529, V534–V539, V544–V549, V554–V559, V564–V569, V574–V579, V584–V589, V594–V599, V604–V609, V614–V619, V624–V629, V634–V639, V644–V649,



## References

- 1 The social costs of alcohol misuse in Northern Ireland for 2008/09  
[https://www.drugsandalcohol.ie/13337/1/NI\\_Social\\_costs\\_of\\_alcohol\\_misuse\\_200809.pdf](https://www.drugsandalcohol.ie/13337/1/NI_Social_costs_of_alcohol_misuse_200809.pdf)
- 2 New Strategic Direction for Alcohol and Drugs Phase 2 – Final Review, Oct 2018  
[https://www.health-ni.gov.uk/sites/default/files/publications/health/NSD%20PHASE%202%20Final%20Review%20-%20October%202018\\_0.pdf](https://www.health-ni.gov.uk/sites/default/files/publications/health/NSD%20PHASE%202%20Final%20Review%20-%20October%202018_0.pdf)
- 3 STATISTICS PRESS NOTICE – ALCOHOL RELATED DEATHS REGISTERED IN NORTHERN IRELAND (2007-2017) Alcohol Related Deaths reach highest on record  
<https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/Alcohol%20Related%20Deaths%20Press%20Release%202017.pdf>.
- 4 Drink Wise, Age Well: Alcohol Use and the Over 50s in the UK.  
<https://drinkwiseagewell.org.uk/wp-content/uploads/2016/01/Drink-Wise-Age-Well-Alcohol-Use-and-the-over-50s-Report-2.pdf>
- 5 Adult drinking habits in Great Britain: 2005 to 2016  
<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/drugusealcoholandsmoking/bulletins/opinionsandlifestylesurveyadultdrinkinghabitsingreatbritain/2005to2016>
- 6 World Health Organisation Report (WHO) 2010. Best practice in estimating the costs of alcohol – Recommendations for future studies  
[http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0009/112896/E93197.pdf](http://www.euro.who.int/__data/assets/pdf_file/0009/112896/E93197.pdf)
- 7 Rice DP et al. (1990). The economic cost of alcohol and drug abuse and mental illness 1985. San Francisco, Institute for Health and Aging (DHHS Publication No. (ADM) 90-1694).
- 8 York Health Economics Consortium, University of York (2010), The Societal Cost of Alcohol Misuse in Scotland for 2007. Edinburgh: Scottish Government Social Research.
- 9 Cabinet Office (2003), Alcohol misuse: How much does it cost?
- 10 Assessing the costs to the NHS associated with alcohol and obesity in Wales (2010) Welsh Assembly Government Social Research, 2011.
- 11 Lister, G. et al (2008), Measuring the Societal Impact of Behavior Choices, *Social Marketing Quarterly* 14:1, pp. 51–62; Lister, G. et al (2006), Comparing the Societal Impacts of Common Health Risks. National Social Marketing Centre.
- 12 Aberdeen: Johnston, M. et al (2012), Inequalities in the Distribution of the Costs of Alcohol Misuse in Scotland: A Cost of Illness Study, *Alcohol and Alcoholism* 47:6, pp. 725–31.
- 13 <https://www.pssru.ac.uk/>

- 14 Census of drug and alcohol treatment services in Northern Ireland 2017 published by DOH statistics and research.  
Source: <https://www.health-ni.gov.uk/sites/default/files/publications/health/drug-alcohol-census-2017.pdf>
- 15 <https://www.who.int/classifications/icd/icdonlineversions/en/>
- 16 Local Alcohol Profiles for England 2017 user guide  
<https://www.gov.uk/government/statistics/local-alcohol-profiles-for-england-november-2017-update>
- 17 Alcohol's impact on the emergency services'  
[http://www.ias.org.uk/uploads/alcohols\\_impact\\_on\\_emergency\\_services\\_full\\_report.pdf](http://www.ias.org.uk/uploads/alcohols_impact_on_emergency_services_full_report.pdf)
- 18 Northern Ireland Hospital Statistics - Emergency Care 2017-18  
<https://www.health-ni.gov.uk/news/northern-ireland-hospital-statistics-emergency-care-2017-18>
- 19 <https://www.opendatani.gov.uk/dataset/gp-prescribing-data>
- 20 <http://www.nias.hscni.net/download/public/Corporate/Reports/Annual%20Reports/NIAS-Annual-Report-and-Accounts-2017-18-low.pdf>
- 21 Alcohol's impact on emergency services  
[http://www.ias.org.uk/uploads/alcohols\\_impact\\_on\\_emergency\\_services\\_full\\_report.pdf](http://www.ias.org.uk/uploads/alcohols_impact_on_emergency_services_full_report.pdf)
- 22 NHS (2012), The cost of alcohol harm to the NHS in England (2009/2010)
- 23 Beatson, J. (2015), Drunk Scots call for ambulance every 21 minutes, The Scotsman, 10 April. Available:  
<http://www.scotsman.com/news/health/drunk-scots-call-for-ambulance-every-21-minutes-1-3742546#axzz3oLAAf7sQ>
- 24 Delker E, Brown Q, Hasin DS. Alcohol Consumption in Demographic Subpopulations: An Epidemiologic Overview. (2016) Alcohol Res.; 38(1):7-15.
- 25 Office of National Statistics (2018)  
<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/causesofdeath/bulletins/alcoholrelateddeathsintheunitedkingdom/registeredin2017>
- 26 Angus C, Holmes J, Pryce R, Meier P, Brennan A. Model-based appraisal of the comparative impact of minimum unit pricing and taxation policies in Scotland: an adaptation of the Sheffield Alcohol Policy Model version 3. SchARR, University of Sheffield, 2016.  
[https://www.sheffield.ac.uk/polopoly\\_fs/1.565373!/file/Scotland\\_report\\_2016.pdf](https://www.sheffield.ac.uk/polopoly_fs/1.565373!/file/Scotland_report_2016.pdf)





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