

How much are people in Scotland really drinking?

A review of data from Scotland's routine national surveys

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Abbreviations

ABV	the percentage of alcohol by volume
CI	confidence interval
GHS	General Household Survey
HEPS	Health Education Population Survey
HBSC	Health Behaviour in School-Aged Children
HMRC	HM Revenue and Customs
SALSUS	Scottish Schools Adolescent Lifestyle and Substance Use Survey
SDDUYP	Smoking, Drinking and Drug Use Among Young People
SDDUYT	Smoking Drinking and Drug Use Among Young Teenagers
SHeS	Scottish Health Survey

Foreword

Whenever we talk about Scotland's drinking culture it always seems to come down to a few apparently very simple questions.

- How much do we drink each day, week or month?
- Do men drink more than women?
- How much do young people drink?
- Are we drinking more or less than we used to?

And yet they're very difficult questions to address, often because the 'evidence' we produce appears to be contradictory and as a result confusing.

Alcohol is a significant and growing problem in Scotland in terms of mortality, morbidity and social harm. We are buying more alcohol than ever before, and yet surveys of alcohol consumption suggest that people may be drinking less.

This important study explores some key issues about the information we use when talking about alcohol problems.

On a personal and individual level, it highlights that when asked about our drinking we tend to say we drink less than we do, and less frequently than we'd care to admit. This could be for lots of reasons: we find it difficult to admit because it's so personal; we are ignorant of what a standard unit of alcohol actually looks like; or we just can't remember. Equally, we could be unaware of the alcoholic strength of the drinks we are drinking today.

On a scientific level, it shows that the calculations we have been making are based on assumptions that underestimate the alcoholic strength and serving size of certain drinks. Many beers, lagers, wines and ciders contain more alcohol than they used to and wine and home-poured spirits are drunk in larger glasses, but analysts haven't quite caught up with these changes.

On a consumer level, we don't know how much alcohol is bought in Scotland. Why is this important? Well, by all comparisons our alcohol problems exceed those evidenced in other parts of the UK. We need to know much more about how much alcohol is sold specifically in Scotland if we are to make the much needed changes to our understanding, behaviour and attitudes about alcohol.

This isn't just a study of underestimation and miscalculation; this is a study of the impact this underestimation and miscalculation has not only on understanding the problems we face, but also the solutions we need to find. Its value lies in helping us reconfigure the problem to make a positive change to our drinking.

Jack Law

Chief Executive

Alcohol Focus Scotland

Background

Alcohol is a significant and growing problem in Scotland in terms of mortality, morbidity and social harm. From 2001 to 2005, alcohol-related deaths rose by 15% and general hospital admissions by 7% while recent results from the Scottish Crime and Victimization Survey indicate that more people view alcohol as a serious social problem.¹ Yet surveys of alcohol consumption suggest that Scots may be drinking less.^{2,3} As they are the main source of data for national monitoring of drinking behaviour, it is important that survey estimates of alcohol consumption are as robust as possible.

Aims

Part 1 of this review assesses the validity of Scottish survey data on alcohol consumption, that is, the extent to which they reflect true drinking behaviour, and aims to explain the apparent discrepancy between survey and non-survey indicators of drinking.

Part 2 collates associated estimates of drinking behaviour and interprets them in light of their validity to make definitive statements about drinking trends over the last decade or so.

The review concludes with recommendations for the improvement of Scottish survey data on alcohol consumption in the context of current policy targets and indicators.

Approach

Surveys were selected for inclusion on the basis that they provided data on Scottish drinking behaviour at a national level, were conducted routinely and were commissioned by agencies within Scotland. Four surveys satisfied these criteria:ⁱ

- the Scottish Health Survey (SHeS)
- the Health Education Population Survey (HEPS)
- the Health Behaviour in School-Aged Children (HBSC) study
- the Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS) and previous national school surveys.ⁱⁱ

An overview of each survey and its drinking module is provided in Appendices A and B respectively.

During 2007, the SHeS was redesigned with a core and modular structure and continuous fieldwork. The next survey will run from 2008 to 2011. At the same time, the HEPS was decommissioned and replaced by a module in the SHeS. The new module is similar to the previous survey except that behavioural items have been removed; the module will instead link to the behavioural sections in the main SHeS. The 1998 and 2003 SHeS asked drinking questions of children and young people aged 8–15 years. Because of space constraints, limited potential for analysis given the relatively small sample size and concerns about the robustness of these estimates (see pages 24, 39 and 46 for further details), these questions have been removed from the next survey.

ⁱ The General Household Survey (GHS) monitors drinking behaviour amongst adults in Great Britain. The survey contains a Scottish sample (about the same size as the HEPS and therefore similarly constrained in terms of the scope for subgroup and time trend analysis) but has not been included within the review as it is managed outwith Scotland. Estimates have been included where they add to the information supplied by the SHeS and HEPS.

ⁱⁱ The SALSUS was first conducted in 2002 and is run every 2 years. The survey continues the biennial Smoking Among Secondary Schoolchildren series conducted between 1982 and 2000 in England and Scotland. From 1990, the surveys included some questions on drinking and in 1998 a small set of questions on drug use was also included and the name revised to Smoking, Drinking and Drug Use Among Young Teenagers (SDDUYT). Another name change followed in 2000: Smoking, Drinking and Drug Use Among Young People (SDDUYP).

Together, these changes mean that Scotland now commissions only one survey to assess alcohol consumptionⁱⁱⁱ in adults (SHeS) and one to assess alcohol consumption in children and young people (SALSUS), whereas data were previously available from two surveys for each target group. Reliance on a single source places greater emphasis than ever before on the choice of drinking methodology and the robustness of resultant estimates.

Validity

To assess the accuracy of Scotland's survey data on alcohol, estimates have been compared with UK sales data and the following aspects of their validity examined:

- self-reporting
- fieldwork period
- measurement instruments and their appropriateness in relation to Scotland's national targets and key indicators on alcohol
- response rates and sample representativeness
- assumptions about typical drink size and strength
- precision of estimates.

Trends

Analysis was performed on the original datasets from the 1995, 1998 and 2003 SHeS; HEPS 1996–2005; 2002 and 2004 SALSUS and previous national school surveys in 1998 and 2000. The Scottish HBSC team at the Child and Adolescent Health Research Unit supplied the results of the required analysis of Scottish data from the 1994, 1998 and 2002 HBSC surveys.

Results from the 2006 HBSC study, SALSUS and HEPS are not included as the data were not available for analysis at the time of writing. The SALSUS 2006 national report was released in late 2007 and published results have been commented on where relevant.

Estimates of adult drinking were drawn from the SHeS and HEPS. To ensure comparability between surveys and over time, data were analysed for adults aged 16–64 only. Measures include:

- prevalence of drinking
- average weekly consumption
- proportion exceeding the recommended weekly limits
- prevalence of binge drinking.

Estimates of child drinking were drawn from the SHeS, SALSUS and previous national school surveys, and the HBSC study. To ensure comparability between surveys and over time, data were analysed for children aged 13 and 15 only. Measures include:

- experience of alcohol
- frequency of drinking
- experience of drunkenness
- average weekly consumption.

ⁱⁱⁱ The HBSC continues to monitor children and young people's experiences of alcohol but it does not measure alcohol consumption.

Findings Part 1: Validity of alcohol surveys

Comparison with UK sales data

Surveys are known to underestimate true alcohol consumption.⁴⁻⁶ There is no gold standard for measurement of alcohol intake but sales data provide an objective indication of consumption and have been used within this report to quantify the level of survey underestimation. However, it is important to note that sales data provide an *estimate* of alcohol consumption and can therefore only *estimate* survey underestimation.

There are two types of alcohol sales data: industry figures are derived mainly from invoiced sales whereas HM Revenue and Customs' (HMRC) duty clearances are based on product released for domestic sale, not actually sold. To give a population-level estimate of consumption, the volume of alcohol sold, or released for sale, is divided by the size of the UK population (usually those aged 15 and over) and expressed in litres per head. This *known* amount is moderated by several factors, whose quantity is *unknown*, to give the amount actually consumed (Figure 1). Alcohol obtained via cross-border shopping, illicit purchases and home-brewed products all adds to the amount of alcohol available for consumption. Together with the inclusion of non-drinkers within the population denominator, these factors have an underestimating influence on true per capita intake. Conversely, unrecorded exports (HMRC data do not consistently record product originally released for domestic sale but then exported from the UK⁷) reduce the amount of alcohol available for consumption and therefore lead to overestimation of intake. Product released for sale but not sold (applies to HMRC figures only), sold but not consumed (either because it is being stored or has been poured away as waste) or consumed by under-15s further reduces the amount of alcohol consumed per adult head of population and thereby leads to overestimation of intake. Attempts have been made to estimate some of these factors, e.g. spirits tax fraud,⁸ but the net effect remains unknown. An additional problem with sales data is that they are currently available only at UK level and may conceal subnational differences in alcohol consumption.

Fig 1: Factors leading to under- and over-estimation of alcohol consumption using sales data
(net effect unknown)

Underestimating Influences:

- cross-border purchases
- illicit purchases
- home-brewed product
- inclusion of non-drinkers in population denominator



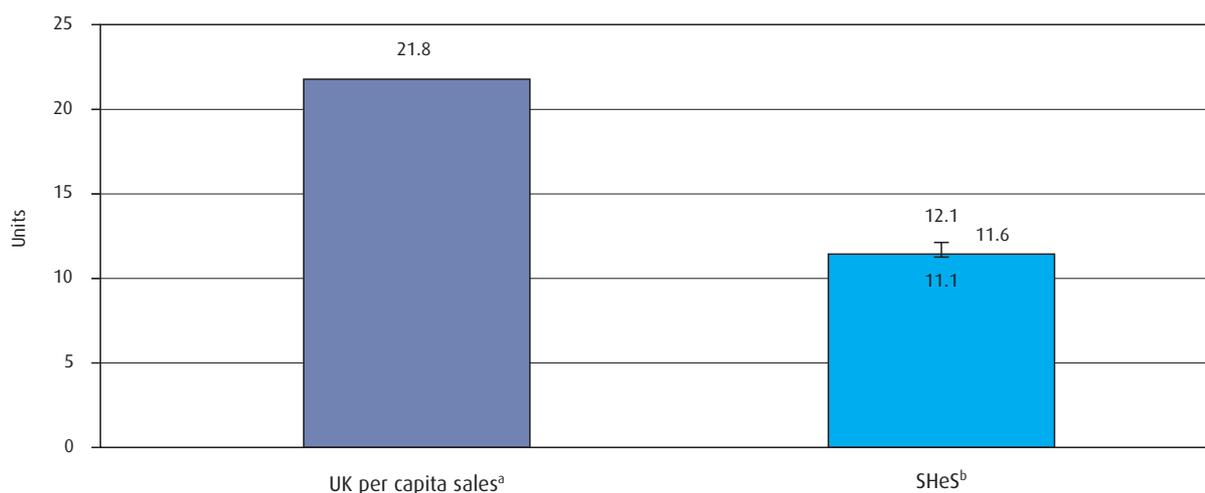
Overestimating Influences:

- unrecorded exports
- product released for sale but not sold
- product sold but not consumed
- product drunk by under-15s

Survey underestimation of alcohol intake

HMRC figures for alcohol released for sale in 2003 equate to an average of 22 units per week when expressed per head of UK population aged 15 and over (Figure 2). By contrast, adult respondents (aged 16 and over) to the 2003 SHeS reported drinking an average of 12 units per week. Comparison with UK sales data therefore suggests that survey underestimation of alcohol intake may be as great as 50%. As sales data and surveys both estimate alcohol consumption, and it is currently unclear which is the most accurate,^{iv} this figure should be treated with caution. However, underestimation of at least 50% is supported by a separate study commissioned by Health Scotland, which found that mean weekly consumption was 40 units in a small ($n=70$) non-random sample of Scottish adults.⁹

Fig 2: Average weekly alcohol consumption: UK sales versus SHeS self-report, 2003



^aBased on HM Revenue and Customs figure (11.34 litres per head of population aged 15 years and over) published in *The Drink Pocket Book 2006*.¹⁰

^bBased on adults aged 16 and over; the 95% confidence interval is shown.

Survey underestimation of alcohol intake over time

As long as the level of inaccuracy in survey estimates remains constant over time, they can still provide important information about time trends. However, if underestimation of alcohol intake has altered, time series data will be unreliable and potentially misleading in terms of real population change.

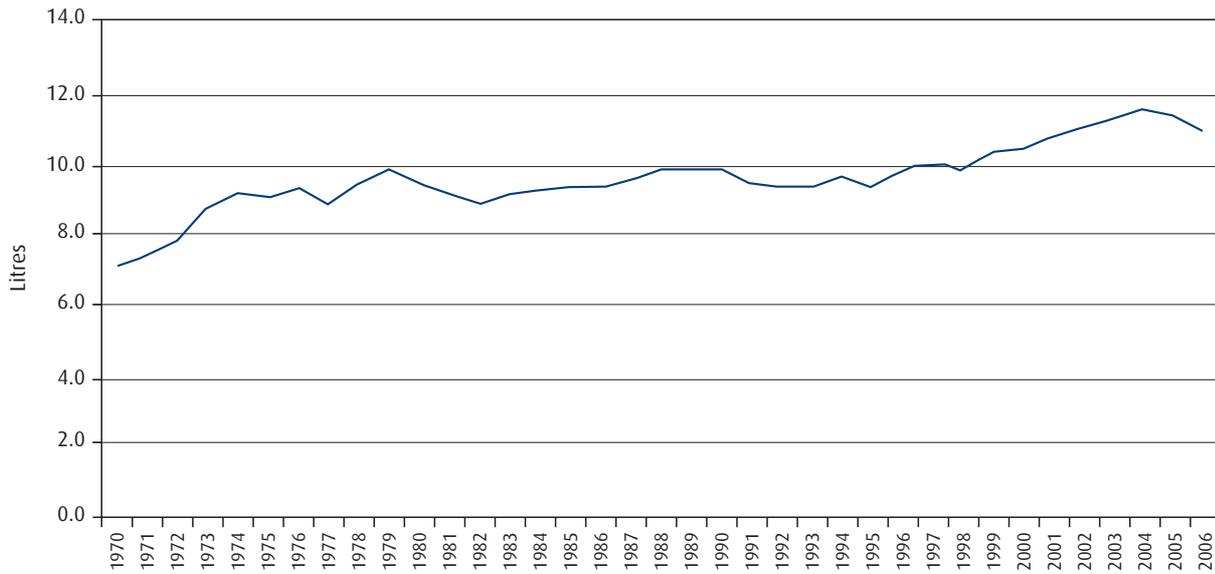
UK sales of alcohol have risen over the last decade, suggesting that alcohol consumption has increased (Figure 3). In 1995, an average of 9 litres of pure alcohol was sold per head of population aged 15 and over in the UK. By 2005, this figure had risen to 11 litres per head of population. Averaging consumption over the year, these quantities equate to 18 units of alcohol per week in 1995 and 22 units per week in 2005 (Figure 4).

During this period, data from the SHeS are available for only 3 years but they suggest a decline in alcohol intake rather than an increase. The widening gap between UK sales figures and SHeS estimates suggests that survey underestimation of alcohol intake has increased over time (Figure 4). In 1995, SHeS estimates of weekly consumption were 5 units lower than the UK per capita sales figure (13 units versus 18 units) but by 2003 the difference had increased to 10 units (12 units versus 22 units).

The General Household Survey (GHS)¹¹ provides further evidence of an increase in survey underestimation of alcohol intake (Figure 4). Although consistently lower than UK sales figures, estimates from the survey followed the same trend during the 1990s. However, from 2000, estimates levelled out while sales continued to rise.

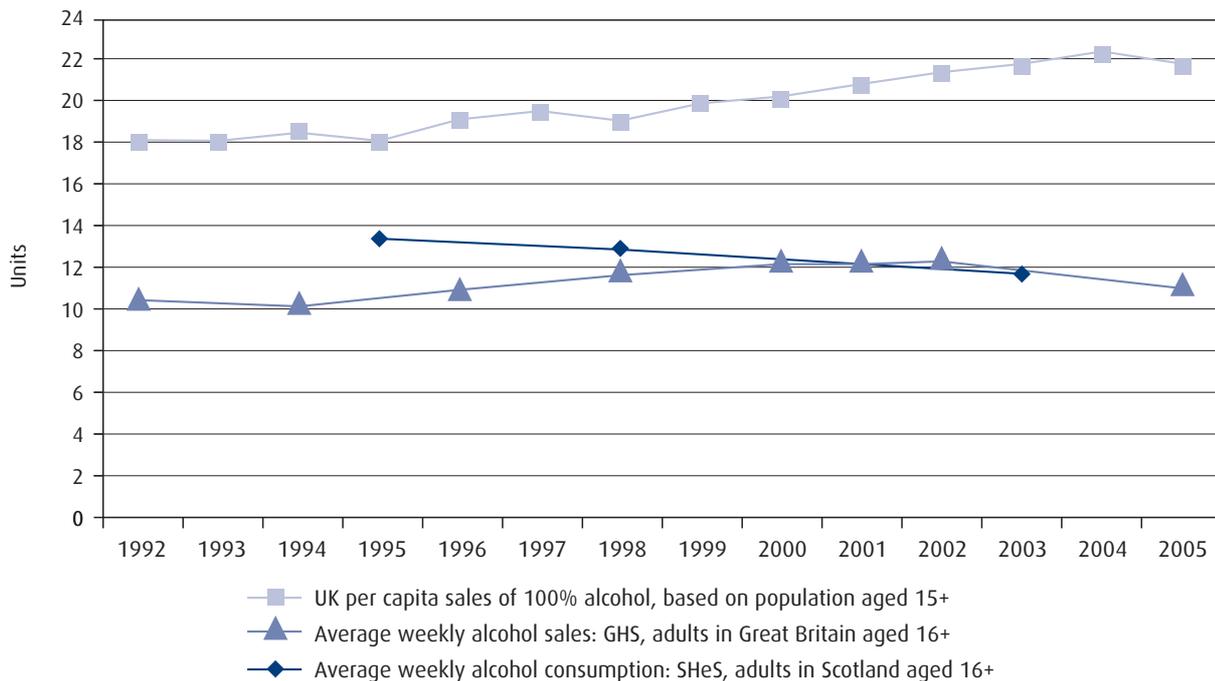
^{iv} The Department of Health is currently reviewing HMRC and survey sources of alcohol consumption to see which provides the best picture of current consumption – scheduled for completion in 2008.

Fig 3: UK per capita sales of 100% alcohol



Figures are based on the population aged 15 years and over. Source: *British Beer and Pub Association Statistical Handbook 2007*.¹²

Fig 4: Average weekly alcohol consumption: UK sales data, General Household Survey (GHS) and the Scottish Health Survey (SHeS)



Strengths of survey data on alcohol

Despite their limitations, it is important to remember that alcohol surveys provide several types of information that sales data cannot. They:

- reveal who is doing the drinking
- describe drinking patterns as well as volume of consumption
- allow comparisons over time and between different population subgroups and geographies
- allow linkage of consumption patterns with other data at the individual level.

These advantages make good survey-based estimates of alcohol consumption essential.

Reasons for survey underestimation of alcohol intake

There are many reasons for survey underestimation of alcohol intake. This section looks at the influence of self-reporting of intake, fieldwork period, survey instruments, under-representation of heavy drinkers and underlying assumptions about typical drink size and strength. By examining changes over time, it identifies which of these factors may have contributed to the apparent increase in survey underestimation of alcohol consumption.

Self-reporting

Comparative studies illustrate that people tend to understate self-reported alcohol consumption. Perrine *et al.*¹³ observed the amount of alcohol consumed by participants in a public bar setting and then compared this with self-reports provided in a personal interview shortly afterwards. Self-reported consumption was significantly lower than that observed.

The accuracy of alcohol self-reports is influenced by a very wide range of factors. Del Boca and Darkes¹⁴ recognise as many as 16 and classify them into three broad groups: social context or environmental factors, respondent characteristics, and attributes of the task. Some can be influenced to improve the accuracy of estimates but others cannot, meaning that a degree of error is unavoidable with self-reported measures of alcohol intake.

The wider social context influences responses as it defines the social desirability of drinking behaviour. As publicity about the harmful effects of alcohol has intensified, those who respond to surveys may have become more likely to under-report their consumption. Thus, an increase in social desirability bias may have contributed towards the recent increase in survey underestimation of alcohol intake.

Fieldwork period

A further proportion of the discrepancy in estimates of alcohol consumption between survey and sales data arises from the period to which the data refer. HMRC figures are based on annual consumption whereas fieldwork dates for surveys are typically chosen to avoid holiday periods and Christmas, when consumption is likely to be higher than usual. Reference periods of 1 year and 1 week each have their own advantages and disadvantages in terms of the accuracy of estimates, but when the latter is used with fieldwork conducted over a few weeks or months (as opposed to data collection throughout the entire year), it is very important that follow-up surveys are conducted at the same time of year to ensure comparability over time.

Fieldwork dates for the SHeS and HEPS have remained relatively constant and are therefore unlikely to have influenced the accuracy of survey estimates of alcohol intake. SHeS fieldwork has always been conducted over a minimum period of 12 months. HEPS fieldwork is usually undertaken in March and September of each year, although the 2006 and 2007 spring waves were brought forward to January to provide pre- and post-data for evaluation of the smoking ban. The SALSUS and previous national school surveys have experienced the greatest variation in fieldwork timing. Data are usually collected in the autumn term, although the 2002 and 2004 sweeps of the SALSUS were conducted later in the school year during the spring term. Slightly older age and maturation throughout the school year are likely to have raised, rather than lowered, the 2002 and 2004 estimates of alcohol intake.

The HBSC study does not monitor alcohol intake but consistency in timing of data collection is important as age and maturation throughout the school year affect experience of alcohol. There has been little change in fieldwork period across the time series; the survey goes into field in the spring term, usually February–March, although it has been slightly accelerated or delayed in specific years.

Survey instruments

Surveys usually rely on one of two methods to estimate alcohol consumption.

- The *retrospective 7-day diary* measures how much alcohol respondents actually drank in the previous week. It leads respondents through each day of the previous week asking how many drinks they consumed of each type of alcohol on each day.
- The *quantity–frequency method* measures how much alcohol respondents usually drink by asking how often they have drunk each type of alcohol over a specified reference period (usually 1 year) and how much of it they typically consume.

As the quantity–frequency method does not provide information on specific drinking episodes, it is often supplemented with questions on the heaviest drinking day during the previous week to assess periods of greater than usual consumption (Box 1). However, the World Health Organization recommends using the graduated quantity–frequency method for this purpose as it is more accurate and is also able to measure the frequency of binge drinking.⁴

Box 1: What is binge drinking?

There is currently no nationally or internationally agreed definition of ‘binge drinking’. In the UK, Alcohol Concern¹⁶ recommends using the Office of National Statistics’ definition of heavy drinking (8 or more units for men and 6 or more units for women on at least 1 day in the week) as an approximation of binge drinking. **A binge is therefore defined as 8 or more units for men and 6 or more units for women in one session.** The rationale for use of these limits includes consistency with the sensible drinking guidelines – they correspond to double the upper end of the daily benchmarks – and that consumption of this amount of alcohol is likely to lead to intoxication. There is no commonly agreed measure of binge drinking in children.

Table 1 summarises the measures of drinking generated by the 7-day diary, quantity–frequency and graduated quantity–frequency methods, as well as their respective advantages and disadvantages.

There has been no change over time in the instruments used by the SHeS, HEPS and SALSUS to measure alcohol intake. This component of survey methodology cannot, therefore, have contributed towards increasing underestimation of alcohol intake over time.

Table 1: Strengths and weaknesses of approaches used to measure alcohol consumption

	7-day diary	Quantity-frequency	Graduated quantity-frequency
Measures			
Daily consumption	✓	X ^a	X
Compliance with daily benchmarks	✓	X ^a	✓ ^b
Compliance with binge-drinking thresholds	✓	X	✓
Weekly consumption	✓	✓	X
Compliance with weekly limits	✓	✓	X
Advantages	<ul style="list-style-type: none"> Only approach that provides information about levels <i>and</i> patterns of alcohol consumption. Can therefore be used to monitor all measures of sensible drinking 	<ul style="list-style-type: none"> Longer reference period (usually 1 year) produces more reliable estimates making it the ideal choice for measuring weekly consumption Quicker to administer than 7-day diary and therefore suitable for use in multi-topic surveys 	<ul style="list-style-type: none"> Best method for estimating compliance with binge-drinking thresholds; provides most accurate measure of the proportion of the population exceeding thresholds and also provides a reliable estimate of the frequency of binge drinking
Disadvantages	<ul style="list-style-type: none"> Estimates may not be representative of an individual's drinking behaviour because of variation in drinking behaviour over time Greatly underestimates percentage of population exceeding binge-drinking thresholds,¹⁵ which requires a longer measurement period the less frequently thresholds are exceeded, and is therefore not recommended for this use⁴ Too detailed and time-consuming for use in multi-topic surveys 	<ul style="list-style-type: none"> Assesses 'usual' drinking. Does not provide information on specific drinking episodes or patterns of drinking. Is therefore unsuitable for estimating daily consumption, compliance with the daily benchmarks or binge-drinking thresholds Usually combined with questions about heaviest drinking day in the previous week to assess binge drinking. Because of the use of a short reference period, the heaviest drinking day approach is subject to the same limitations as the 7-day diary method (poor reliability of estimate leading to underestimation of the percentage of the population who binge drink). It also does not allow measurement of the frequency of binge drinking 	<ul style="list-style-type: none"> As it asks about different types of alcohol in a single question, this method relies on the 'standard drink' approach, which leads to inaccuracies in estimates of alcohol intake because of considerable variation in alcoholic strength of different beverages and a wide range of available serving sizes. By using this method in conjunction with the quantity-frequency approach, it may be possible to incorporate information about the type, strength and size of drinks usually consumed to produce more accurate estimates of quantity consumed per drinking episode

^a Averaging techniques can be used to produce a proxy for daily consumption but they are not recommended as alcohol intake is often not evenly spread over time.

^b Could be used to monitor compliance with daily benchmarks using careful (and sex-specific) selection of the frequency and quantity categories.

Scotland's survey instruments in the context of national targets and key indicators

The best tool for measurement depends on what you want to measure. In relation to adults, Scotland's targets and key indicators for alcohol focus on compliance with the weekly limits and a reduction in binge drinking (Boxes 2 and 3). The quantity–frequency approach is the method of choice for measurement of weekly volume of alcohol consumed and this method is already used in the SHeS. Binge drinking is best measured using the graduated quantity–frequency method whereas the SHeS currently uses questions regarding heaviest drinking day in the previous week. Replacing these questions with the quantity–frequency method would improve the accuracy of binge-drinking estimates and, if both were run concurrently to establish the difference in respective estimates, a correction factor could be applied to previous data to protect the time series.

There are no national targets for alcohol for children and young people, but several key indicators have been identified for monitoring progress towards the reduction of harmful drinking (Box 2):

- *Number who drink regularly and age at which they start drinking regularly* – monitored by both the HBSC and SALSUS and also included within the 1995 and 1998 SHeS. The surveys do not determine the age at which children start drinking regularly per se. Rather, each asks respondents how often they currently drink anything alcoholic to give the proportion of children that are regular drinkers within each of the targeted age groups (HBSC: 11-, 13- and 15-year-olds; SALSUS: 13- and 15-year olds; SHeS: 8- to 15-year-olds).
- *Alcohol intake* – measured by the SALSUS.

As the SHeS and SALSUS are now Scotland's only surveys to assess alcohol consumption in adults and children respectively, it is more important than ever that each employs the best possible methodology to maximise the robustness of associated estimates.

Box 2: Scotland's national targets and key indicators for alcohol

Targets

To reduce the incidence of adults exceeding weekly sensible drinking levels:

- from 33% to 31% for men between 1995 and 2005 and to 29% by 2010¹⁷
- from 13% to 12% for women between 1995 and 2005 and to 11% by 2010.¹⁷

Key indicators

- To reduce binge drinking.^{18,19}
- To reduce harmful drinking by children and young people. Indicators include the numbers of children who drink regularly, the age at which they start doing so and the amounts that they drink.¹⁸

Box 3: Sensible drinking guidelines for adults

Weekly limits²⁰

Men: up to 21 units of alcohol each week, with 1 or 2 alcohol-free days each week.

Women: up to 14 units of alcohol each week, with 1 or 2 alcohol-free days each week.

Daily benchmarks²¹

Regular consumption of between 3 and 4 units a day by **men** of all ages will not accrue significant health risk. Consistently drinking 4 or more units a day is not advised as a sensible drinking level because of the progressive health risk it carries.

Regular consumption of between 2 and 3 units a day by **women** of all ages will not accrue significant health risk. Consistently drinking 3 or more units a day is not advised as a sensible drinking level because of the progressive health risk it carries.

Under-representation of heavy drinkers

By definition, household surveys only sample those living in private households. They therefore exclude hostel dwellers, the military and students. A recent study of the homeless in Glasgow found that over half reported hazardous drinking,²² and both other groups are likely to contain a higher than average proportion of heavy drinkers.^{4,5}

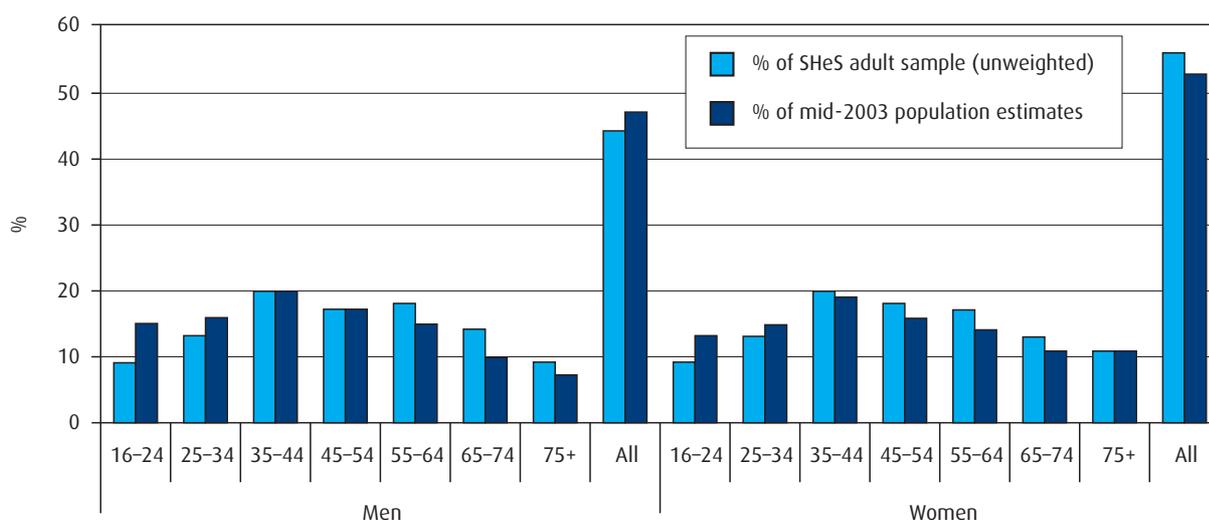
Even if they are included within the sampling frame, heavy drinkers may be more difficult to contact than others. Women and the elderly tend to be over-represented in surveys whereas men and younger individuals (Figure 5), who have a higher alcohol consumption than average (Figure 6), are traditionally harder to reach.

Weighting of results corrects for under-representation of specific population subgroups, but low response rates are problematic if respondents and non-respondents *with the same socio-demographic characteristics* behave differently. The evidence on differences in alcohol consumption between survey respondents and non-respondents remains inconclusive – some studies have found higher levels of alcohol intake amongst non-respondents whereas others have not²³ – but the scope for bias in survey estimates increases as response rate declines.

Surveys have seen a general decline in response over recent years and Scotland has been no exception. Apart from the HEPS, which included a contractual clause requiring a minimum response rate of 70%, the response rate to Scotland's drinking surveys has fallen considerably over the last decade (Figure 7). Because of a change in the sampling design of the 2003 SHeS, both household and individual responses are presented. In 1995 and 1998, only one adult per household was selected for interview. Thus, there is no distinction between household and adult responses in these sweeps of the survey.^v In 2003, the survey selected all adults in each household. Although this change in sampling methodology brings other benefits (see page 23 of the *SHeS 2003 Technical Report*²⁴), the lower adult response rate (60%) is not directly comparable with earlier figures and may mean that resultant estimates are less representative. In terms of people's willingness to take part in the survey, household response provides a better comparison over time.

Although there is no agreed standard for an acceptable minimum response rate, one of 75% and above is generally considered good.²⁵ With response rates as low as those recently observed (60–67%), the representativeness of estimates from Scotland's drinking surveys is of increasing concern. If those who do not take part drink more than those who do, survey estimates will be misleadingly low. As survey response rates have declined, the scope for response bias has increased and may have contributed to increasing survey underestimation of alcohol intake over time.

Fig 5: Age distribution of 2003 SHeS adult sample at interview (unweighted) versus mid-year population estimates for Scotland



Source: Table 1.10 of *SHeS 2003 Technical Report*²⁴

^v The slight discrepancy between the 1998 household (77%) and individual (76%) response rates arose because there were some households in which the household questionnaire was completed but no individual questionnaires were answered.

Fig 6: Percentage exceeding recommended weekly limits, by sex and age: SHes 2003

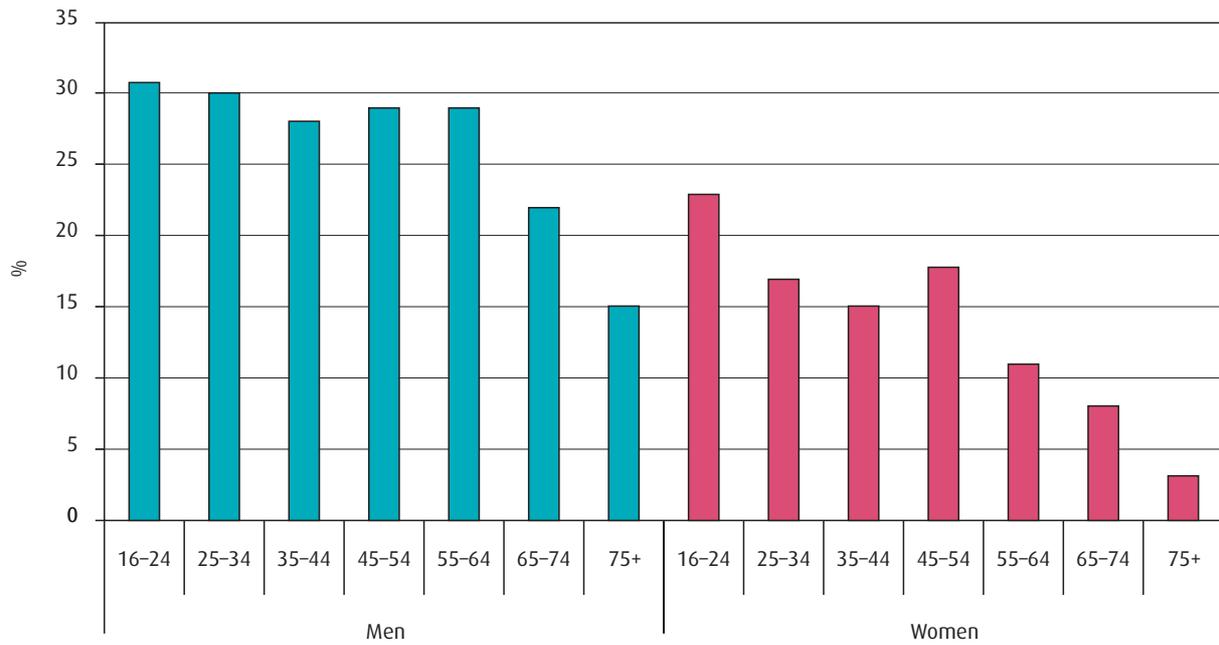
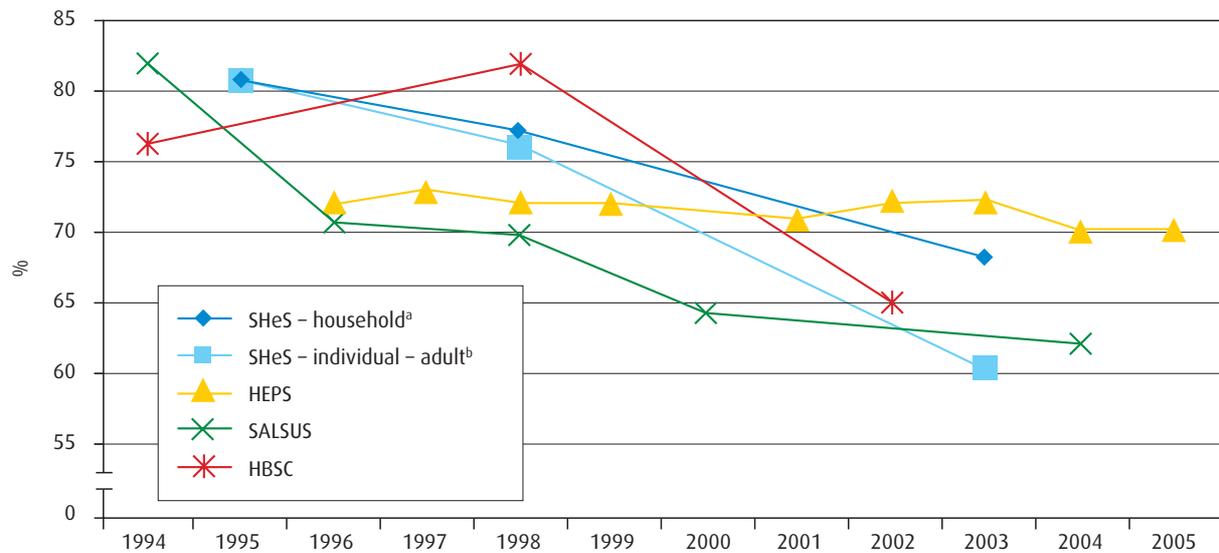


Fig 7: Survey response rates over time



^a Defined as the percentage of sampled households in which at least one eligible person is interviewed. The 2003 value (68%) combines household response for the main (67%) and child boost sample (77%) and was calculated using the figures in Table 1.1 of the *SHes 2003 Technical Report*.²⁴

^b Defined as the percentage of eligible adults interviewed.

Survey assumptions about drink size and strength

To estimate alcohol intake, surveys must estimate both the size and alcoholic strength of drinks consumed. This is usually achieved by making assumptions about *typical* drink size and strength. The accuracy of survey estimates depends upon the accuracy of both sets of assumptions.

Drink size

Approaches to estimating drink size in Scotland's alcohol surveys have led to an underestimation of alcohol intake for wine and spirits. They do not take account of 35ml pub measures of spirits and substantially underestimate pub servings of wine (Table 2). A recent study by Gill and Donaghy²⁶ conducted in the Edinburgh region suggests that they also markedly underestimate the typical size of home-poured measures of spirits and wine (Table 3). When asked to pour a drink of the size that they would normally consume at home, on average, participants poured 160ml of wine (around 2 units at 12% or 14% alcohol by volume [ABV]) and 57ml of spirits (2.3 units at 40% ABV). These findings have been closely replicated in another Scottish study (mean measure of vodka 57ml, wine 156ml).⁹ Gill and Donaghy²⁶ used a 175ml wine glass but many participants reported that this was much smaller than the glass that they would use at home, suggesting that 160ml represents a conservative estimate of the size of a typical home-poured glass of wine. The next SHes will address underestimation of drink size for wine by asking respondents to report wine consumption in terms of small (125ml), medium (175ml) or large glasses (250ml).

Table 2: Measures of alcohol legally available within Scottish licensed premises compared with survey assumptions

Type of drink	Measures allowed by law	Measures assumed by Scotland's surveys
Draught beer, lager or cider	Half-pint or pint	SHes: half-pints HEPS: pints SALSUS: pints or half-pints
Wine	125ml, 175ml, or multiples thereof ^a	125ml
Gin, whisky, vodka and rum ^b	25ml, 35ml, or multiples thereof	25ml
Other spirits	May be sold in any measure. In practice, they are often sold in optics and are thus available in measures of 25ml, 35ml, or multiples thereof	25ml
Liqueurs and fortified wine	May be sold in any measure	60ml

^a The majority of establishments serve 175ml and 250ml glasses.

^b If three or more spirits are mixed, for example in a cocktail, they do not have to be served in measured amounts.

Table 3: Typical size of home measures of wine and spirits

	Average home measure ^a	Unit content	Conversion factor in Scotland's surveys
Wine	160ml	1.9 units at 12% ABV 2.2 units at 14% ABV	1 unit
Spirits	57ml	2.3 units at 40% ABV	1 unit

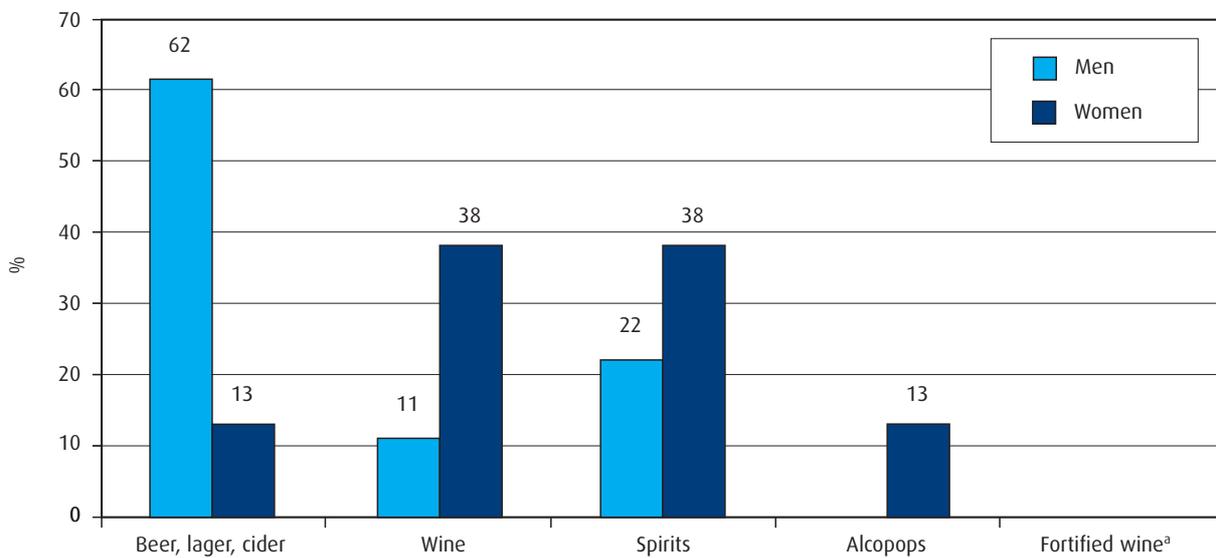
^aSource: Gill and Donaghy.²⁶

As wine and spirits account for three-quarters of female alcohol intake in Scotland, compared with only one-third for men, underestimation linked to serving size will have been more pronounced in women (Figure 8).

Estimating drink size is particularly problematic in younger children as they are less likely to be able to perform the required conversion from actual drink size into standard drinks. The SALSUS is now the only routine national survey that monitors the amount of alcohol consumed by children and young people in Scotland. As it is self-completed in the classroom without interviewer assistance, it is important that the options for serving size are recognised and understood by respondents. Illustrations of glass or container size are helpfully provided for most, although not all, types of alcohol, but use of pub measures to quantify spirit consumption is questionable with a target group who may not have experience of drinking in licensed premises. Moreover, evidence indicates that young people prefer to quantify consumption in fractions of bottles rather than glasses.²⁷

Suggestions for improving estimates of drink size are provided in the final section of this report.

Fig 8: Percentage of weekly intake by type of alcohol in 16- to 64-year-olds: SHeS 2003



^aFortified wine <0.05%.

Drink strength

The introduction of new types of drink (alcopops, designer drinks and coolers) and increases in the alcoholic content of others have increased the strength of beverage alcohol in the UK (Figure 9). Scotland's surveys have added questions on alcopops but alcohol conversion factors have not been updated so that surveys now undercount the number of units in a typical serving of beer/lager/cider and wine (Table 4). Because they are served in larger quantities than other types of alcohol (Table 4), inaccurate assumptions about their typical strengths create the potential for a much larger margin of error when estimating pure alcohol intake. As beer and wine are the most popular types of drink in the UK (Figure 10), the importance of accurately estimating their alcoholic strength is emphasised further.

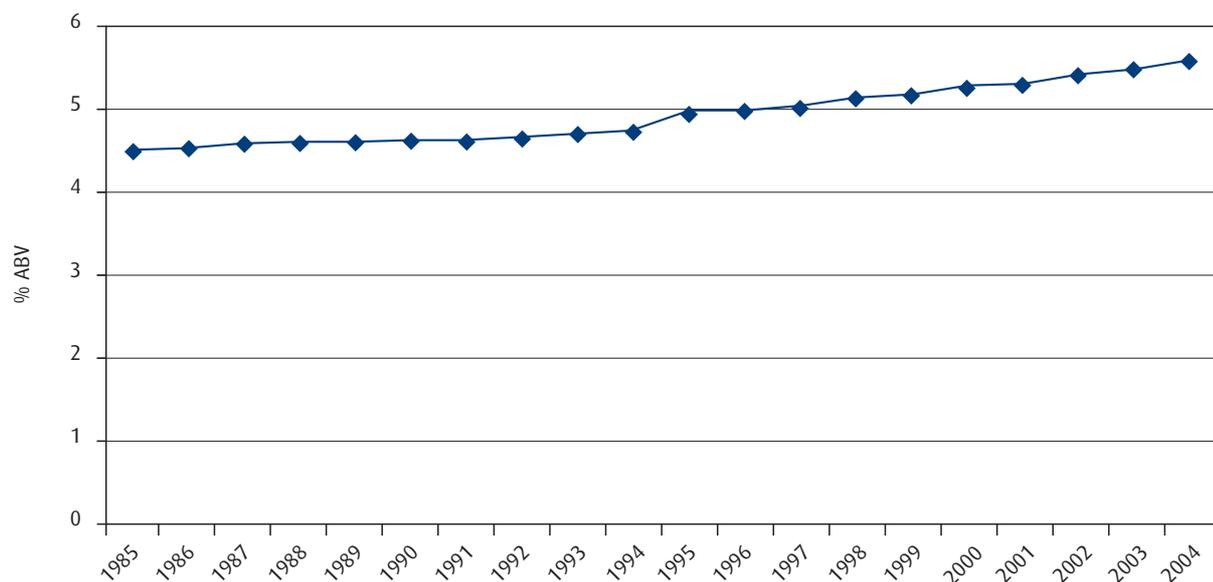
Table 4: Variation in alcohol content by type of drink

Type of drink	% ABV	'Standard' measure	Number of units	Conversion factor in Scottish surveys
Beer, lager or cider	3-9	Half-pint (284ml)	0.9-2.6	Normal strength = 1 unit Strong = 1.5 units
Wine	9-15	Glass (125ml)	1.1-1.9	1 unit
Fortified wine	13-18	Small glass (60ml)	0.8-1.1	1 unit
Spirits, liqueurs	35-45	Single measure (25ml)	0.9-1.1	1 unit

ABV, alcohol by volume.

Table adapted and updated from the English original.⁵

Fig 9: Average strength of all types^a of alcohol combined (beer, cider/perry, wine, made wine^b)

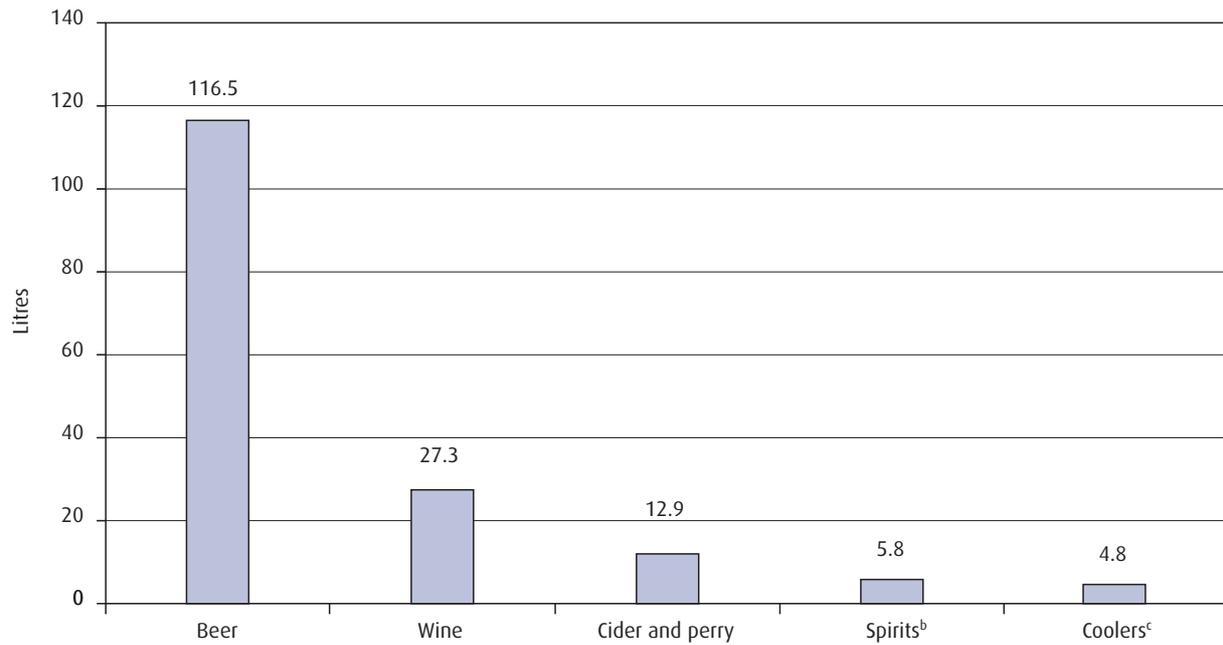


Based on UK per capita sales of alcoholic beverages and 100% alcohol; data published in *The Drink Pocket Book 2006*.¹⁰

^a Spirits are not included because data on sales of beverage spirits are not reported.

^b Includes wine-based low-alcohol products >1.2% and <5.5% ABV from 1988.

Fig 10: UK per capita^a sales of alcoholic drinks (litres), 2005, based on population aged 15 and over



^aBased on population aged 15 and over.

^bOriginal figure is presented as litres of pure alcohol (2.3 litres) and has been adjusted to litres of beverage spirit assuming an ABV of 40%.

^cWine and spirit-based drinks with an ABV of 1.2–5.5%, including flavoured alcoholic beverages/'ready to drink' drinks.

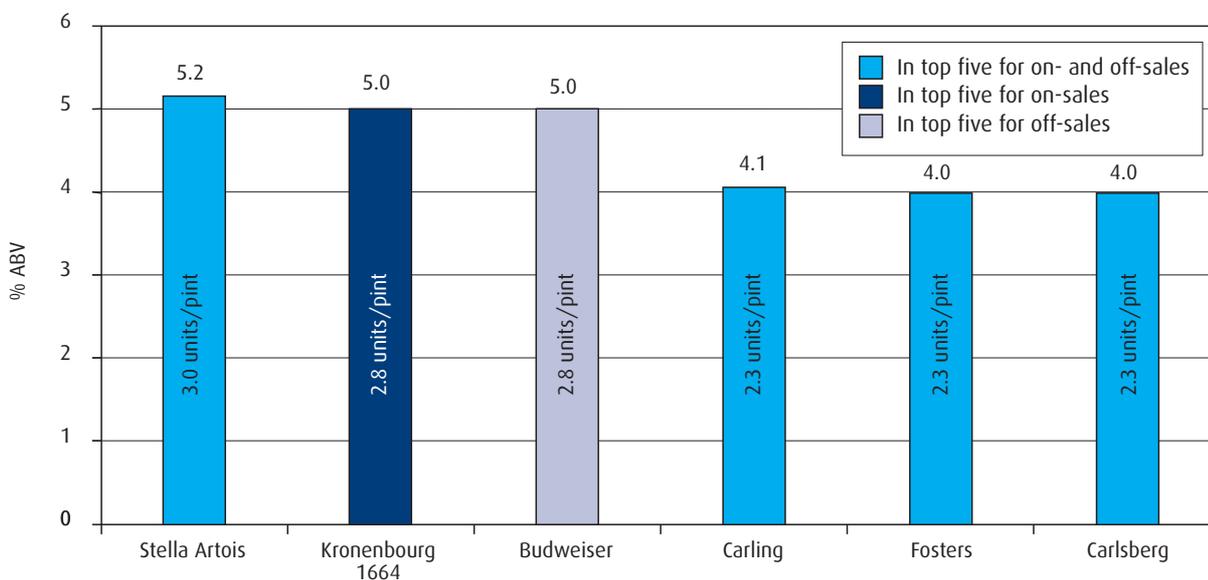
Sources: HM Revenue and Customs, National Statistics, British Beer and Pub Association; published in the *British Beer and Pub Association Statistical Handbook 2006*.²⁹

Half of the most popular brands of lager now contain 3 units per pint (Figure 11). To date, Scotland's surveys have used a conversion factor of 2 units for normal strength beers. Most of the top brands of cider contain 3 units per pint and one contains as many as 4 (Figure 12); surveys have used a conversion factor of 2 units for normal strength and 3 units for strong cider. The strength of the most popular brands of wine ranges from 11.5% to 14.5% ABV (Figure 13); surveys have counted one glass of wine as 1 unit, which assumes an ABV of only 8%. Figure 14 illustrates the number of units contained in a small (125ml), medium (175ml) and large (250ml) serving of wine based on products with an ABV of 11.5% and 14.5%, i.e. the range within the top five brands of wine. Assuming that the average glass of wine, consumed either at home or in a licensed setting, is 175ml in size, a typical serving will contain between 2 and 2.5 units, more than double that allowed for by surveys to date.

Plans are in place to review and update the conversion factors used in the next SHes. The Office for National Statistics (ONS) recently published details of updated conversion factors for beers, lagers, ciders and wine to be used within the GHS, Health Survey for England and ONS Omnibus Survey.²⁸ The surveys will also include a question on size of wine glass (small, standard, large). When applied to GHS data for 2005, the updated methodology increased average weekly alcohol consumption by 32% in the population as a whole, from 10.8 units to 14.3 units. Converting these amounts into litres per year (5.6 litres and 7.4 litres respectively) demonstrates that the changes narrow the gap between the GHS estimate and the HMRC sales figure (11.3 litres)²⁹ by 15%, from 50% to 65%. As undercounting of alcoholic content has been greatest for wine, the new methodology has the greatest effect on estimates for those most likely to be wine drinkers, including:

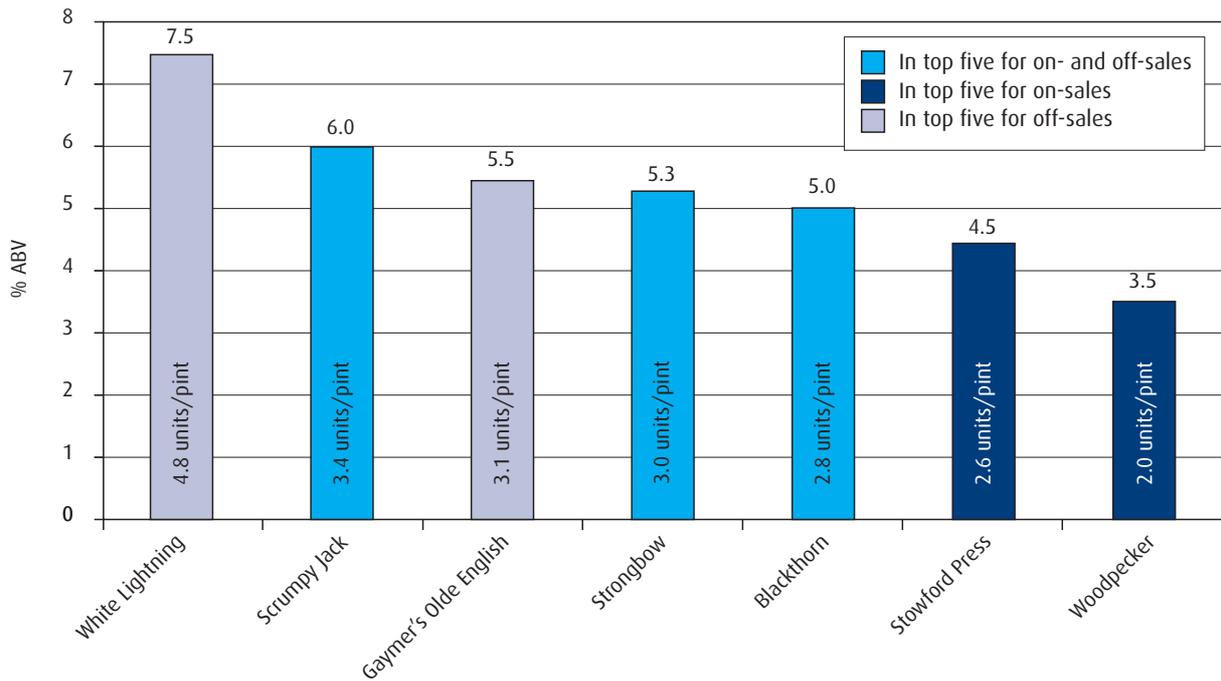
- women
- those aged 25 and older
- those in the managerial and professional socio-economic class (first three categories of NS-SEC8)
- those in high-income households.²⁸

Fig 11: Top UK lager brands, 2004



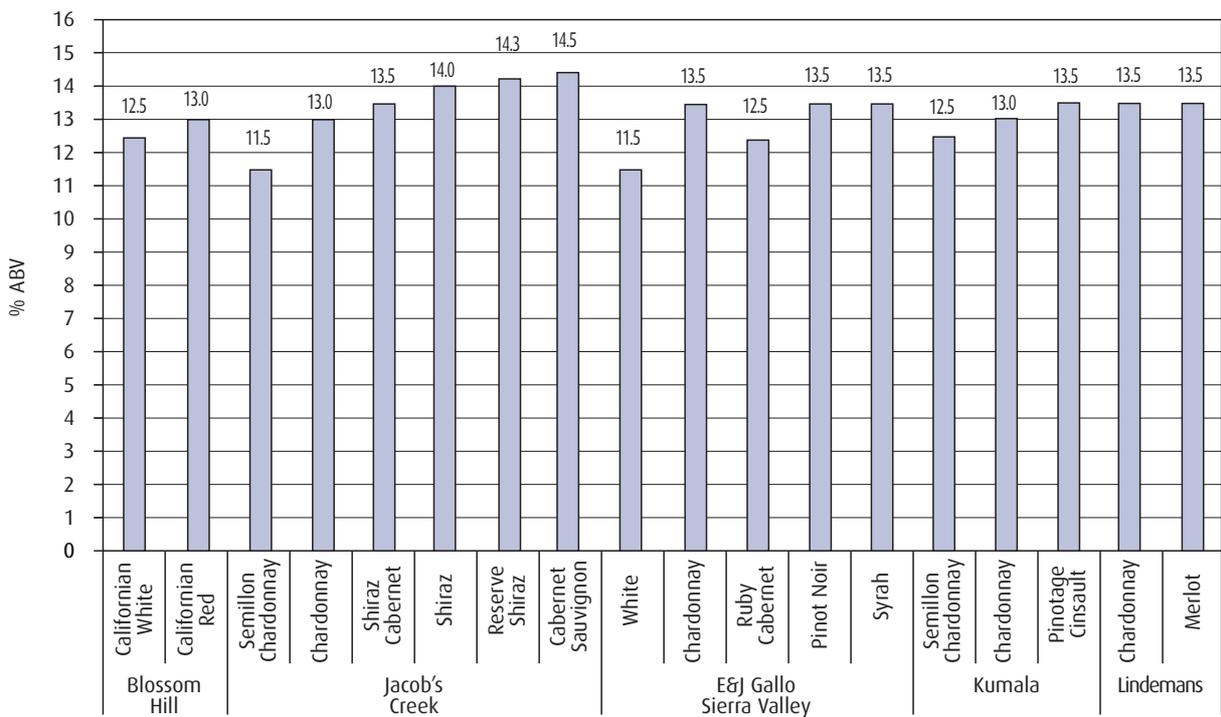
Sources: top brands from *The Drink Pocket Book 2006*,¹⁰ ABVs as listed on products.

Fig 12: Top UK cider brands, 2004



Sources: top brands from *The Drink Pocket Book 2006*,¹⁰ ABVs as listed on products.

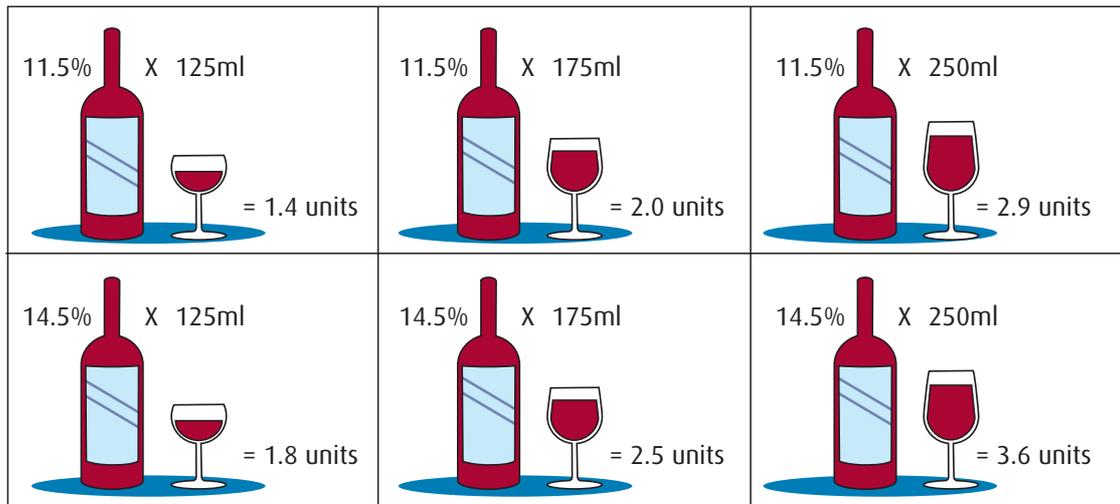
Fig 13: Alcoholic strength of products within top five wine brands, 2004: off-sales



Source: top brands from *The Drink Pocket Book 2006*.¹⁰

To establish the ABVs of individual products, one retail outlet was visited and ABVs identified for each line in stock. The above range of ABVs is therefore indicative rather than exact.

Fig 14: Alcoholic content of small, medium and large glasses of wine at ABVs of 11.5% and 14.5%



In conclusion, survey underestimation of alcohol intake has increased in recent years. Failure to update survey assumptions about typical drink size and strength provides the clearest explanation. Greater under-reporting of intake (a possible consequence of increased publicity on the harmful effects of alcohol) and falling response rates (perhaps resulting in surveys capturing fewer heavier drinkers) may have had an additional influence.

Findings Part 2: Trends

Precision of estimates

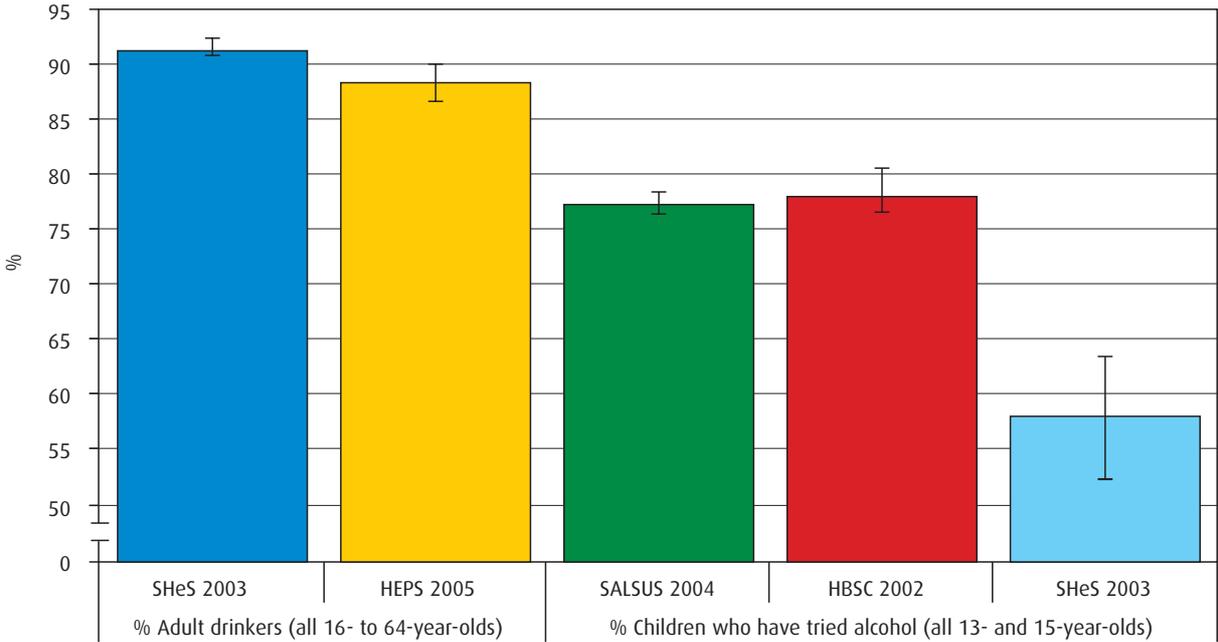
As survey estimates are obtained from a sample of the population they are subject to sampling error, which means that if repeated samples were drawn from the same target population they would vary from sample to sample. The precision of estimates, that is, how closely they reflect the true population value, is influenced by a range of factors such as the size of the sample (see Appendix A), how it is drawn from the target population and natural variation from person to person in the measure of interest.

Confidence intervals provide an indication of the precision of survey results. For a 95% confidence interval, there is a 95% chance that the true population value is contained within the upper and lower confidence limits. The greater the range of values specified by the 95% confidence limit, the greater the uncertainty about the size of the real value. The 95% confidence intervals are represented by 'whiskers' on the bar charts throughout this report.

For adults, levels of precision are highest from the SHeS (Figure 15). Of the three child surveys, when results are considered for 13- and 15-year-olds only, precision is greatest in the SALSUS and lowest in the SHeS. Although the SHeS has a large sample of children overall, the broad age range means that bases are small when results are reported by 1-year age bands – necessary here for comparison with the HBSC and SALSUS surveys.

As precision is reduced, greater uncertainty about the size of the true population value means it becomes more difficult to detect genuine differences when making comparisons, either over time or between subgroups (Box 4). In terms of precision, the SHeS is most able to detect differences over time for adults and the SALSUS for children.

Fig 15: Comparison of precision levels for a point-in-time estimate: 95% confidence interval



Box 4: Looking for evidence of real change

This paper aims to make definitive statements about trends over time. Any use of the term *significant* is taken to mean statistical significance, but a statistically significant result may not imply substantive importance. It may reflect chance variation, or it may not be large enough to be of practical concern. In looking for evidence of *real* change, significant results have been sought that are supported by one or more of the following:

- trends of change in the intervening years
- significant change that is sustained in the long term
- evidence of change from other sources.

As these lines of evidence accrue, the case for real change is strengthened.



Adult drinking

SHeS adult inclusion criteria have broadened over the series from those aged 16–64 in 1995, 16–74 in 1998 and 16+ in 2003. The HEPS survey targeted adults aged 16 to 74. To ensure comparability between both surveys over time, results for all SHeS and HEPS comparisons are presented for those aged from 16 to 64.^{vi} As older adults drink less on average than younger individuals,^{2,30} the estimates presented here are slightly higher than those reported in the original survey publications, which are based on the full target population (with the exception of the SHeS 1995 in which the target population does not differ from that analysed here).

Because of its comparatively small sample size (see Appendix A), HEPS estimates demonstrate much greater variability over time and are less precise than those from the SHeS. The HEPS survey is therefore less able to detect real differences between subgroups or over time.

Percentage of the population who are drinkers

Data from the last SHeS suggest that 93% of men and 90% of women aged 16–64 drink alcohol (Figure 16). More recent data from the HEPS (2005) suggest that the prevalence of drinking is slightly lower, at 88% for both men and women (Figure 17).

Both surveys indicate no significant change over the last decade in the proportion of women who drink. The proportion of men who drink may have fallen slightly; the HEPS demonstrates a pattern of almost consistent decline and estimates from 2003 onwards are significantly lower than those earlier in the series. The SHeS shows a downward trend over time but results do not quite reach significance; data from the next survey will be helpful in determining if a genuine reduction has occurred.

Rates of drinking among men and women may have converged in recent years. Both surveys show a narrowing of the gap between the sexes over time. Although gender estimates from the last SHeS were still significantly different, those from HEPS from 2003 to 2005 were not. Data from the next SHeS will be useful in confirming whether the gap between the sexes has indeed closed.

^{vi} Questions on compliance with the heavy drinking cut-offs (8 units or more for men and 6 units or more for women) were only added to the HEPS in 2006. SHeS estimates are therefore compared with Scottish data from the GHS and, to maximise comparability between the two surveys, are presented for 16- to 74-year-olds.

Fig 16: Prevalence of drinking (SHeS, base = all 16- to 64-year-olds)

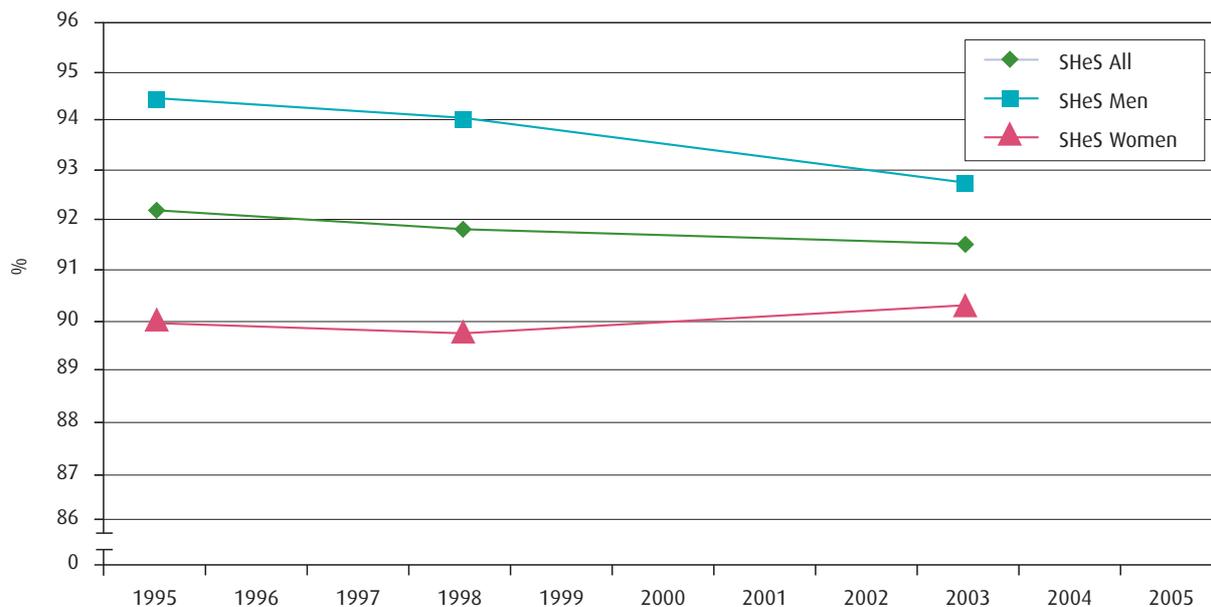
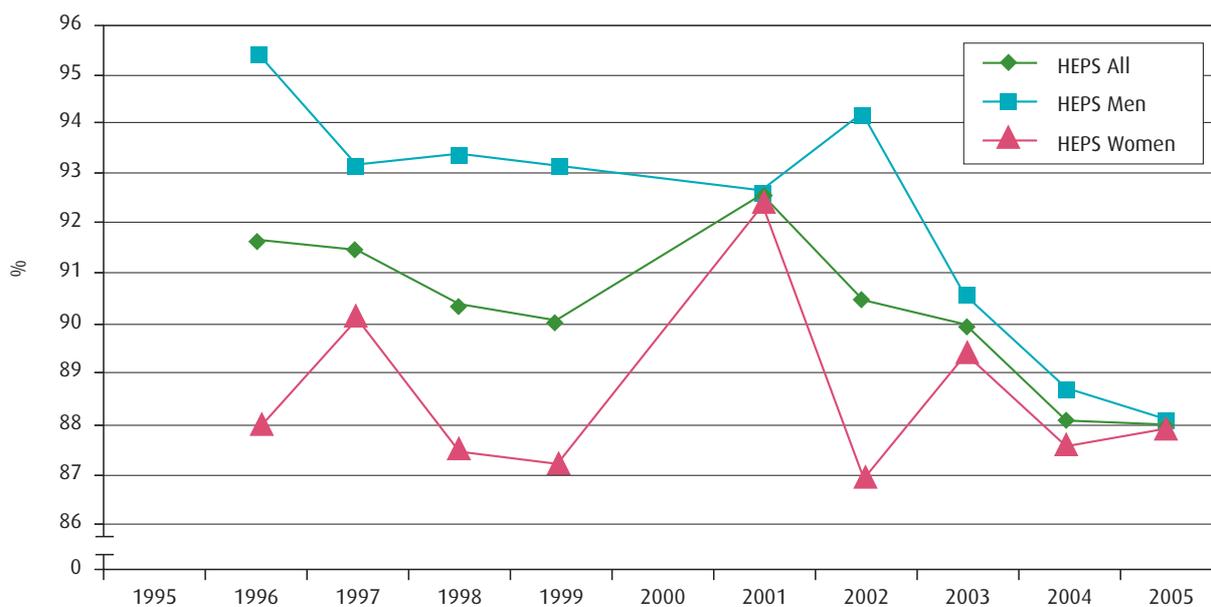


Fig 17: Prevalence of drinking (HEPS, base = all 16- to 64-year-olds)



Average weekly consumption

Data from the last SHeS suggest that, on average, men aged 16–64 drink 18 units of alcohol per week and women 8 units per week (Figure 18). Compared with figures for the whole adult population, results for drinkers alone are 1 or 2 units higher for men and 1 unit higher for women throughout the time series (Figure 19). Both the SHeS and the HEPS show that men drink significantly more per week than women.

Although the SHeS provides the best available alcohol data for Scottish adults, survey underestimation means that *actual* levels of intake will be higher. Exactly how much higher remains unclear, but comparison with UK sales estimates of alcohol intake suggests that surveys may understate alcohol consumption by as much as 50%. Application of the revised ONS methodology to GHS data from 2005 demonstrates that updated conversion factors for beer/lager/cider and wine and improved measurement of the amount of wine drunk increased estimates by around one-third.²⁸ As these changes do not take account of other factors responsible for survey underestimation of alcohol intake (see Part 1), most of which are not amenable to further improvement, increasing survey estimates by one-third will still understate consumption.

Recalculation of the GHS data also shows that survey underestimation of alcohol consumption is not equally distributed across the population.²⁸ As undercounting of alcohol content has been greatest for wine, underestimation is more pronounced amongst those most likely to be wine drinkers: women, those aged 25 and older, those in the managerial and professional socio-economic class (first three categories of NS-SEC8) and those in high-income households.²⁸ Applying the new methods increased alcohol consumption in women by 45% compared with 26% in men.

Recalculation of data from the SHeS time series is planned using updated conversion factors and estimates of drink size. As the effect of the amendments varies with the type of drink consumed, the percentage increase in Scottish consumption may differ from the GHS figures above. However, the GHS percentage increases provide an indication of the likely impact that recalculation will have on Scottish estimates.

Fig 18: Average weekly alcohol consumption (base = all 16- to 64-year-olds, drinkers and non-drinkers)

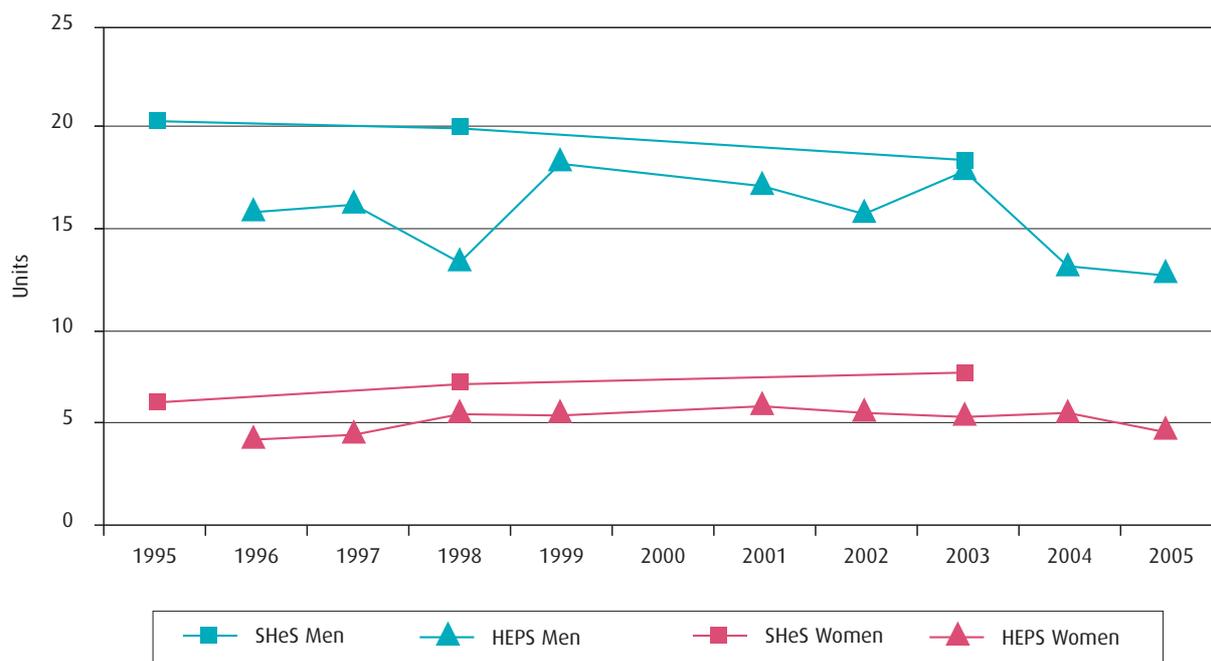
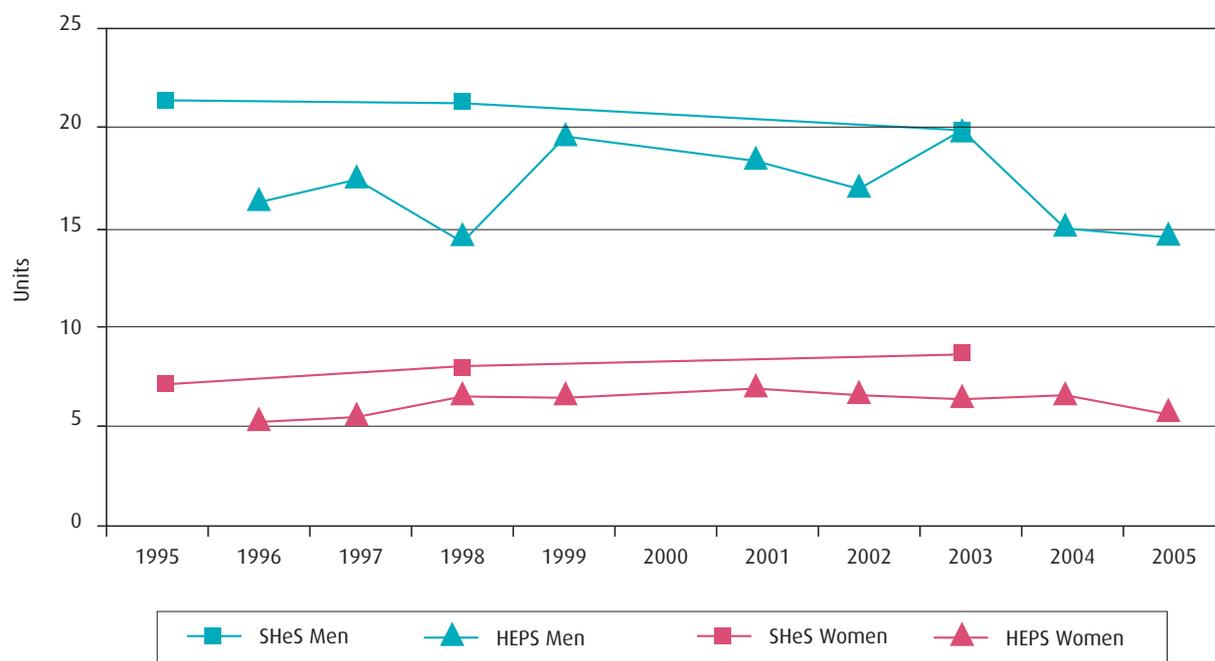


Fig 19: Average weekly alcohol consumption (base = all 16- to 64-year-old drinkers)



Time trends

Scotland's surveys suggest that male weekly alcohol consumption has dropped slightly and that female intake has risen, although it may have peaked. Reductions are modest (2 units a week for men and 1 for women) but they are supported by other survey evidence. Data from the 2005 GHS^{vii} show that men in Great Britain drank about 1.5 units less than they were drinking from 1998 to 2002 and women drank about 1 unit less (Figure 20).^{vii}

Trends for drinkers only (over time, between men and women, between surveys) are the same as for the entire adult population (i.e. drinkers and non-drinkers combined) (Figures 18 and 19).

UK sales data do not support recent survey-based trends in alcohol consumption. They demonstrate an increase in alcohol sales, suggesting that alcohol consumption has *increased* over the last decade, whereas survey results for the adult population as a whole indicate a decline (see Figure 4). This apparent discrepancy is explained, at least in part, by progressively increasing survey underestimation of alcohol intake.

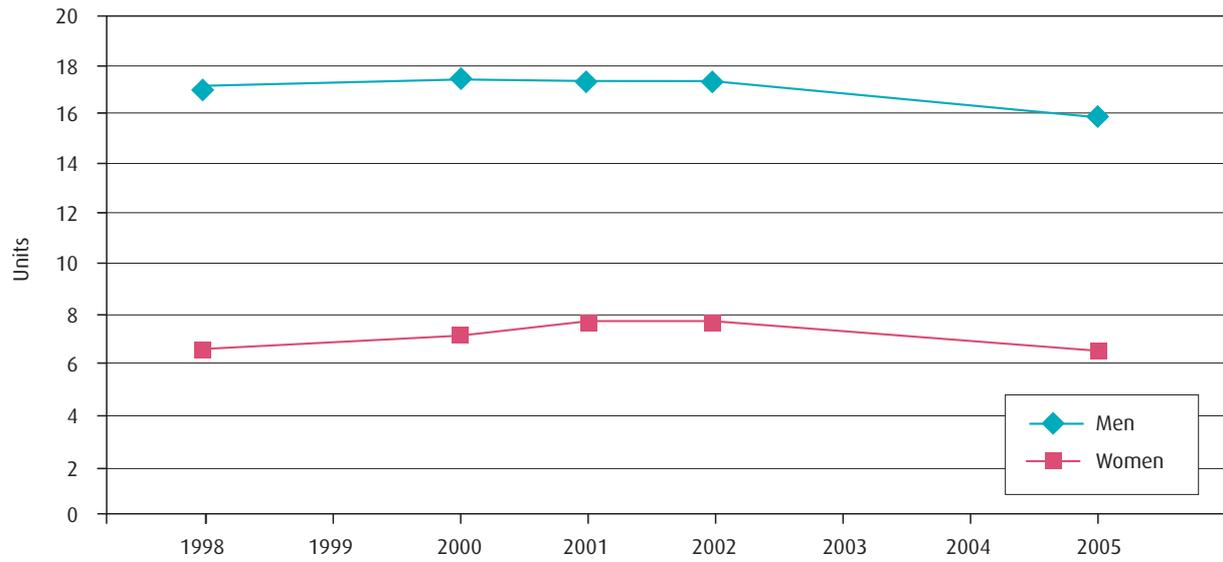
Because underestimation has not remained constant, survey time trend data are potentially misleading. Increased underestimation could entirely explain the apparent reduction in male alcohol intake. Similarly, the apparent rise in female intake followed by a possible peak could disguise a much steeper rise in real intake followed by a continued slower rise.

One of the major limitations of sales data is that they do not allow comparisons between different population subgroups and may therefore obscure differing trends over time. Recalculation of the SHeS time series, using more realistic conversion factors and estimates of drink size for each sweep of the survey, will provide a more accurate picture of *real* trends over time.

UK sales data for 2005 and 2006 are slightly lower than those for previous years (see Figure 3). However, figures for the next several years are required to confirm whether this marks the beginning of real change or if it is simply a temporary drop in a generally increasing trajectory. It would be extremely valuable if these data could be disaggregated to give separate data for Scotland.

^{vii} Although the GHS includes a Scottish sample (2,620 in 2005), data have not been analysed at Scotland level as the 2005 dataset was not lodged with the UK Data Archive at the time of writing. It is possible that estimates for Great Britain conceal a different picture within Scotland.

Fig 20: Average weekly alcohol consumption: GHS, Great Britain (base = all adults aged 16+)



Exceeding the weekly sensible drinking limits

Data from the last SHeS suggest that 29% of men and 17% of women aged 16–64 exceed the weekly sensible drinking guidelines: up to 21 units for men and 14 for women (Figure 21). When drinkers only are considered, these figures rise to 32% of men and 18% of women (Figure 22).

Both the SHeS and the HEPS show that men are significantly more likely than women to exceed the recommended weekly limits. However, they also show that male and female rates of excessive drinking have become more similar over time.

Time trends

Both surveys suggest that there has been a reduction in the proportion of men aged from 16 to 64 years exceeding 21 units of alcohol per week. The GHS provides further support for improvement in male drinking habits, although it is possible that trends within Scotland are not the same as those for Great Britain as a whole (Figure 23). However, survey evidence of a reduction in the proportion of men exceeding the weekly sensible drinking limits may be entirely explained by progressive increases in survey underestimation of alcohol intake.

In terms of female compliance with the weekly sensible drinking limits, time trend results from the SHeS and HEPS are inconsistent. The SHeS shows a significant increase in the proportion of women drinking more than 14 units a week from 1995 to 2003 whereas the HEPS suggests relative stability. As the SHeS uses the quantity–frequency method to assess alcohol consumption – recognised as the gold standard for measurement of weekly alcohol intake⁴ – its estimates are more robust. However, distortion of time trends by progressive increases in survey underestimation of alcohol intake means that the SHeS increase in the proportion of women drinking more than 14 units a week is likely to signify real change on a much steeper gradient. The GHS results, available only for Great Britain as a whole, demonstrate no clear pattern over time in the proportion of women exceeding the weekly sensible drinking limits.

Fig 21: Percentage exceeding recommended weekly limits (base = all 16- to 64-year-olds, drinkers and non-drinkers)

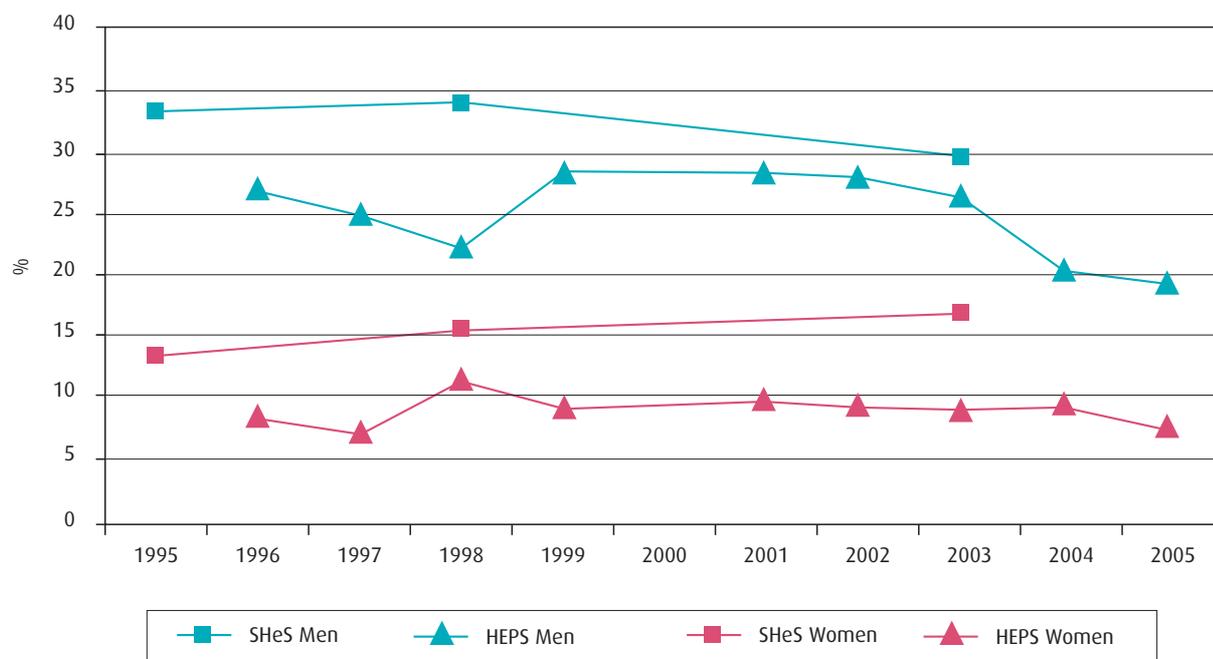


Fig 22: Percentage exceeding recommended weekly limits (base = all 16- to 64-year-old drinkers)

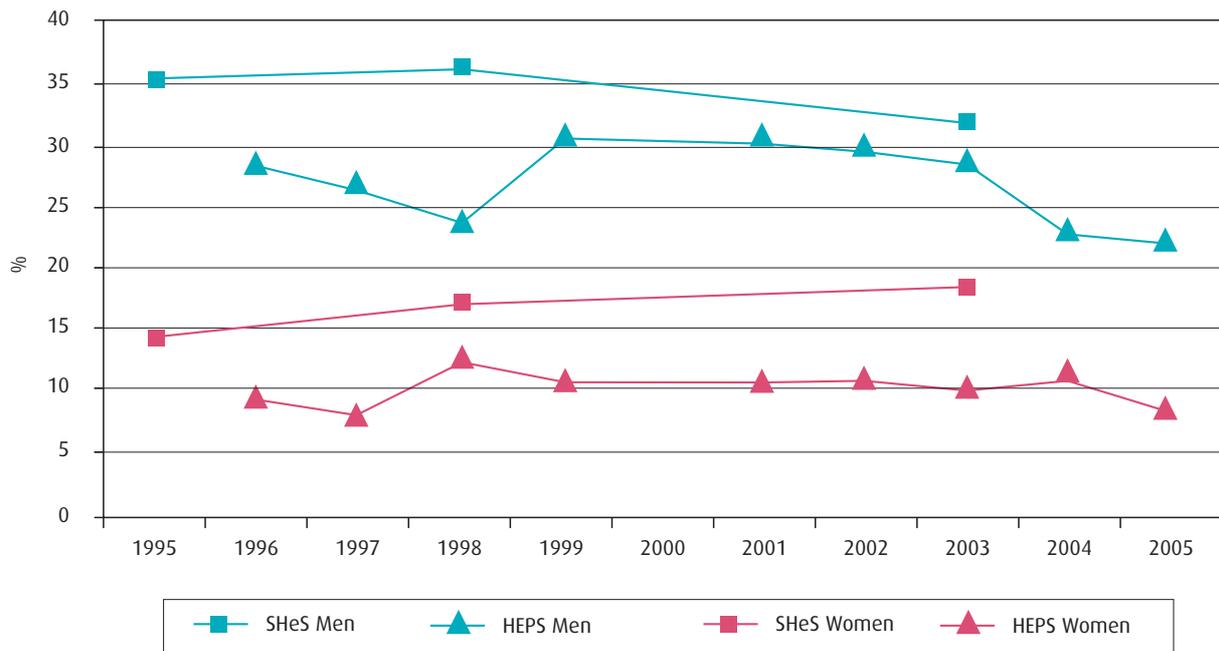
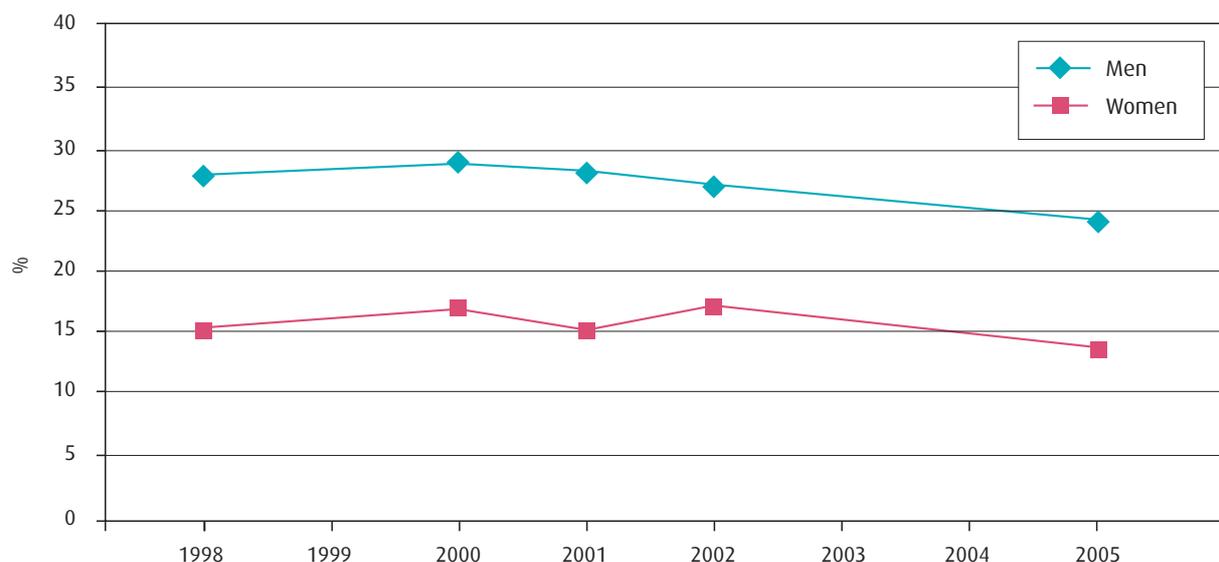


Fig 23: Percentage exceeding recommended weekly limits: GHS, Great Britain (base = all adults aged 16 and over)



Comparison with national targets

Scotland has targets to reduce the prevalence of adults exceeding the sensible weekly drinking guidelines to 29% in men and 11% in women by 2010 (see Box 2).¹⁷ Among 16- to 64-year-olds, SHeS estimates indicate that the male target was reached in 2003 but that female drinking patterns are moving further away from the desired goal. As Scots may be drinking as much as double that suggested by the survey, the *true* proportion of adults exceeding the weekly recommendations will be higher and performance in relation to targets poorer. These effects will be more pronounced in women as they are more likely to drink wine, the alcoholic content of which has been more greatly underestimated than for other types of alcohol.²⁸

Binge drinking

The reduction of excessive drinking is a key priority for action on alcohol in Scotland.^{18,19} The ONS definition of heavy drinking (8 or more units for men and 6 or more units for women) has been used here as an approximation of binge drinking (see Box 1). Few data are currently available (questions to assess consumption at these levels were only added to the SHeS and GHS in 1998) but they allow limited analysis of trends. To maximise comparability with Scottish data from the GHS, SHeS estimates are presented for 16- to 74-year-olds.

Results from the 2003 SHeS show that over one-quarter of 16- to 74-year-old men drank 8 or more units in the week before interview and almost one-fifth of women drank 6 or more units (Figure 24). Excluding non-drinkers from analysis reveals substantially higher estimates: four in ten male drinkers and three in ten female drinkers.

Binge drinking is more common in men and younger individuals (Figures 25–28). The majority of 16- to 24-year-old drinkers consumed 8 or more (men, 61%) or 6 or more (women, 55%) units in the previous week.

Survey underestimation of alcohol intake means that rates of binge drinking will be higher than indicated. The SHeS currently uses questions on heaviest drinking day in the previous week to assess heavy drinking. As this approach uses a short reference period, it is subject to the same limitations as the 7-day diary, which is known to greatly underestimate the proportion of the population who binge drink.¹⁵ Estimates could be improved by adopting the graduated quantity–frequency method, recommended by the World Health Organization for assessing periods of greater than usual consumption.⁴

Fig 24: Percentage who drank ≥ 8 (men) or ≥ 6 (women) units in the previous week (SHeS, base = all 16- to 64-year-olds)

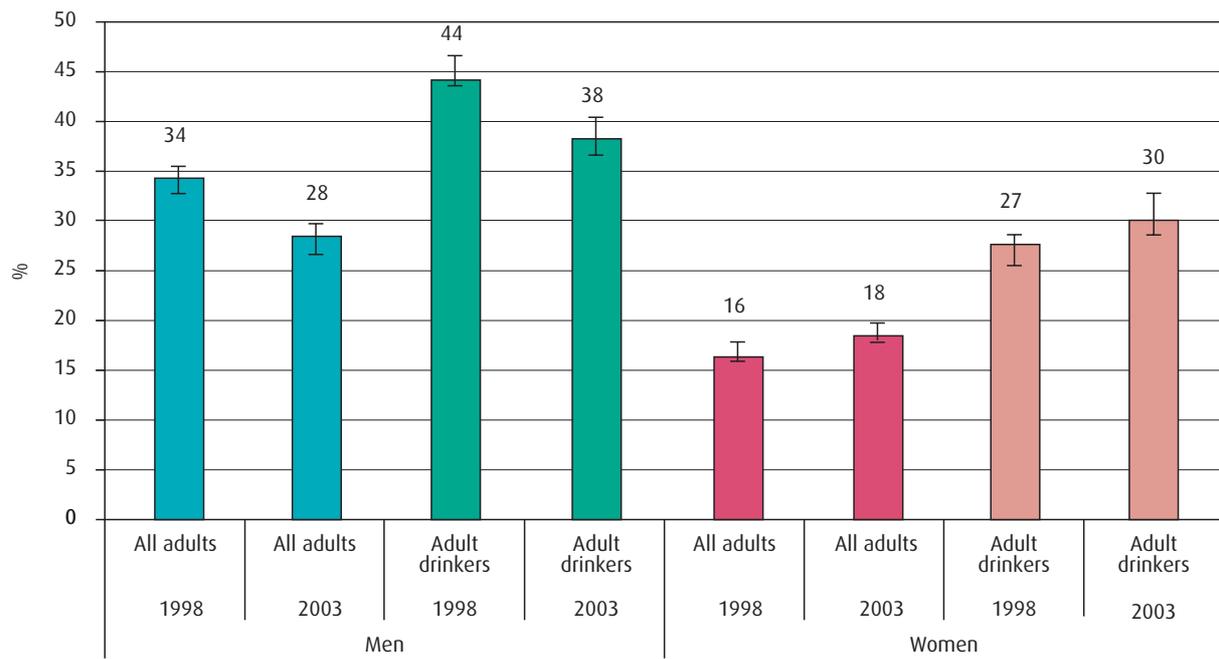


Fig 25: Percentage of men who drank ≥ 8 units in the previous week (SHeS, base = all 16- to 74-year-olds, drinkers and non-drinkers)

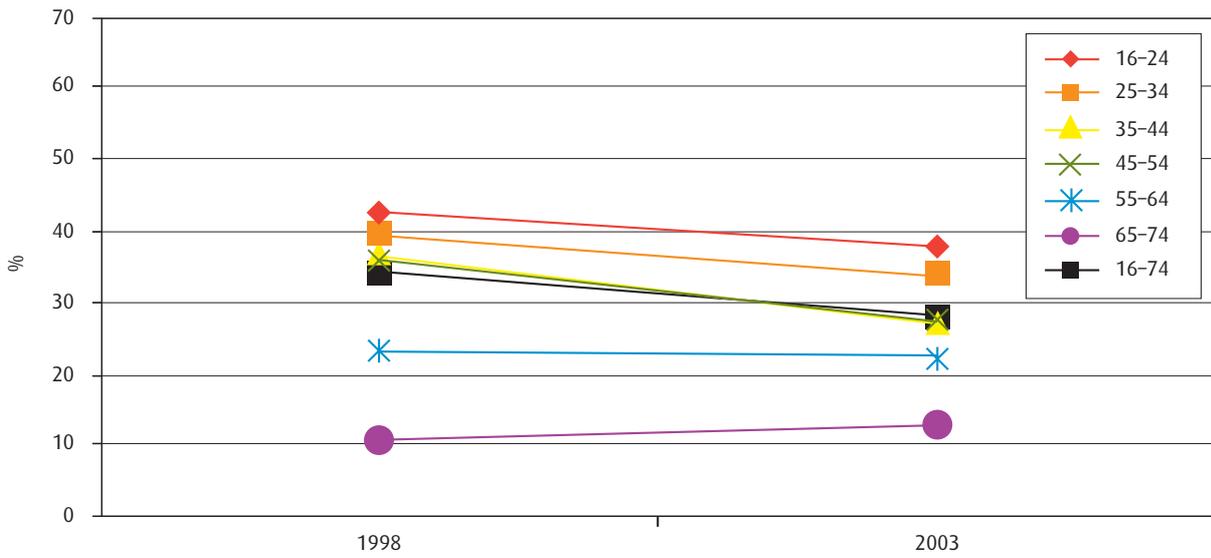


Fig 26: Percentage of women who drank ≥ 6 units in the previous week (SHeS, base = all 16- to 74-year-olds, drinkers and non-drinkers)

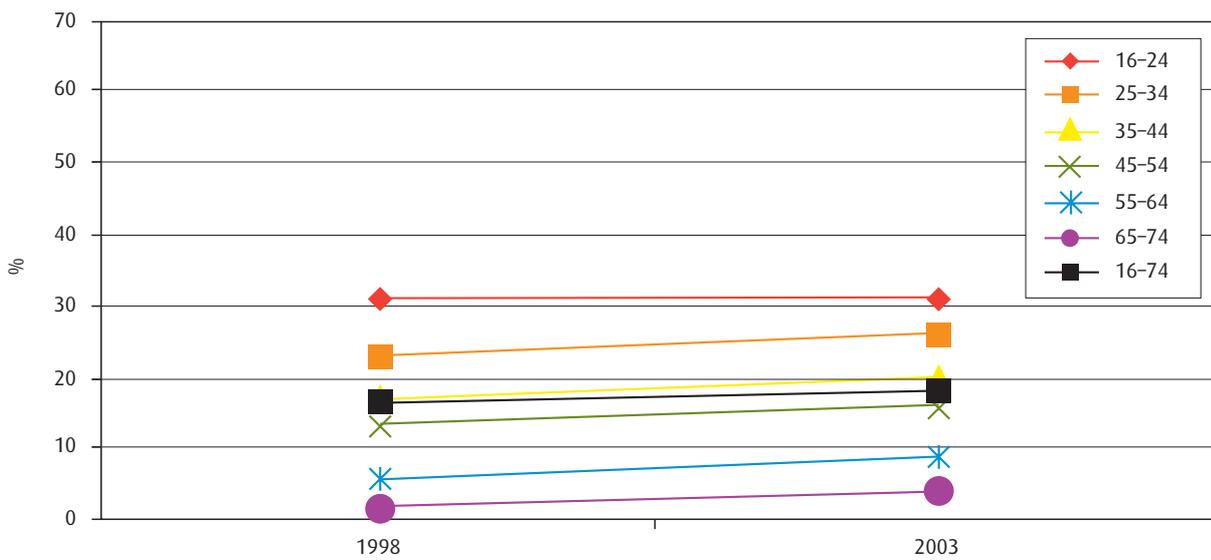


Fig 27: Percentage of male drinkers who drank ≥ 8 units in the previous week
 (SHeS, base = all 16- to 74-year-old drinkers)

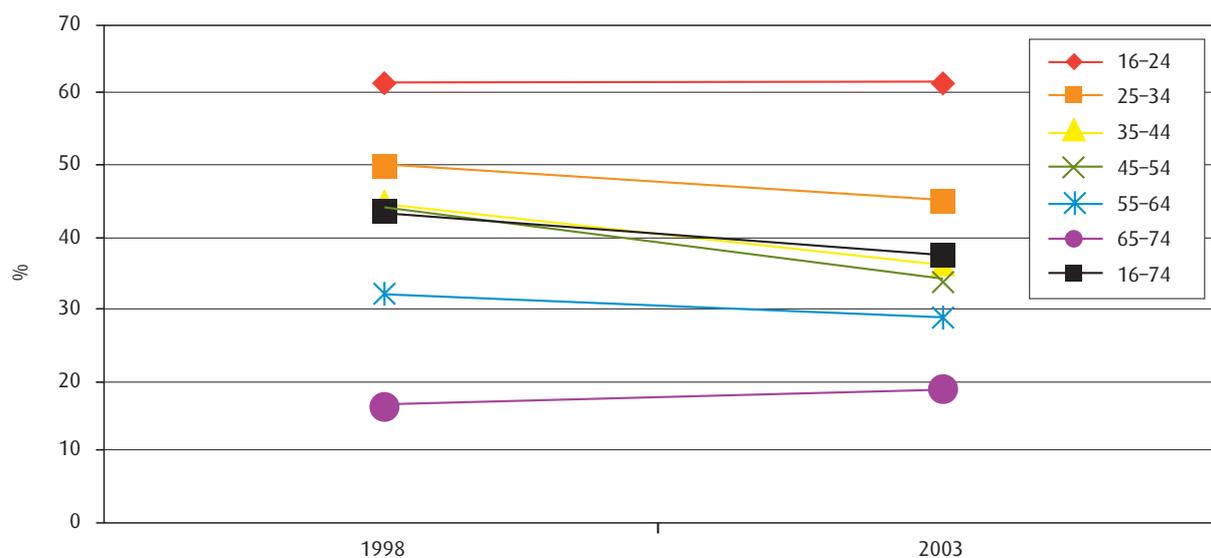
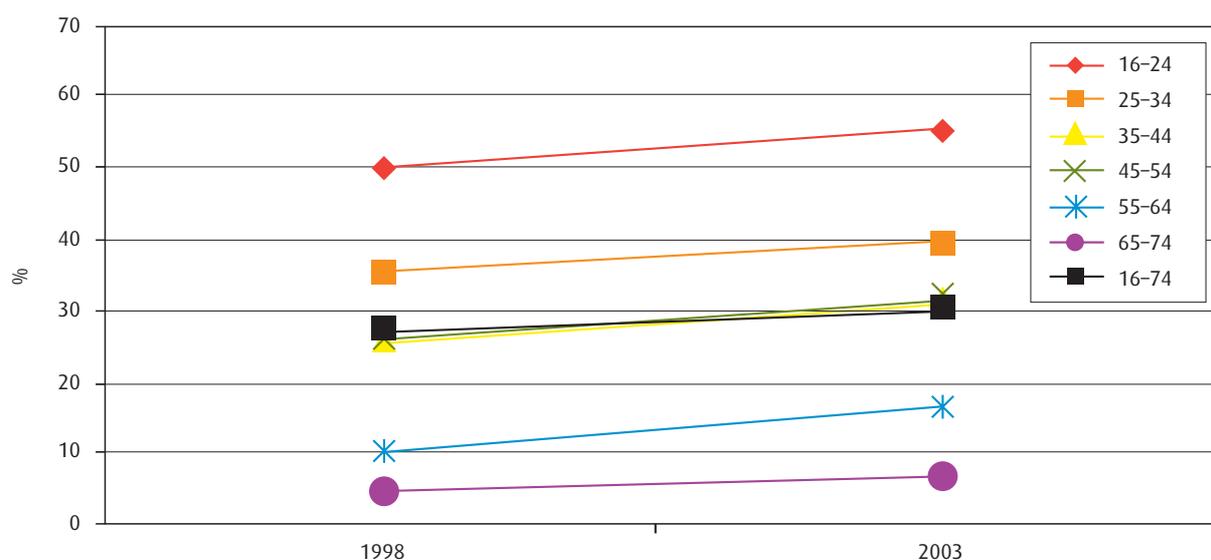


Fig 28: Percentage of female drinkers who drank ≥ 6 units in the previous week
 (SHeS, base = all 16- to 74-year-old drinkers)



Time trends

Both the SHeS and the GHS (Figure 29) suggest that fewer Scottish men are drinking 8 or more units per week, but this could be explained by increasing survey underestimation of alcohol intake over time.

The SHeS provides tentative evidence that female drinkers have become more likely to drink 6 or more units in a single day. This result is not supported by the GHS and the SHeS time series must be extended before any firm conclusions can be drawn. However, increasing survey underestimation of alcohol intake could generate trends of apparent stability or reduction when in fact a real increase has occurred.

Male and female drinking patterns have become more similar over the last two sweeps of the SHeS with smaller differences between the proportions of men and women who drink heavily (Figure 30). In 1998, significantly fewer female drinkers than male drinkers exceeded the heavy drinking thresholds, regardless of age. In 2003, the size of the gender difference was smaller within each age group and was no longer significant amongst those aged under 45.

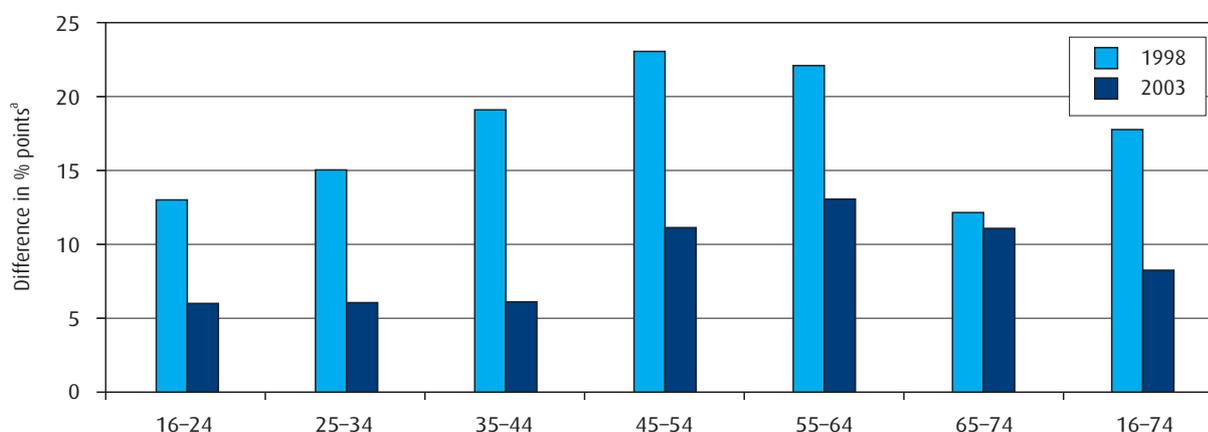
Fig 29: Percentage who drank heavily in the previous week: GHS Scotland^a compared with SHeS^b (GHS Scotland, base = all adults aged 16 and over; SHeS, base = all adults aged 16–74)



^a >8 units men, >6 units women.

^b ≥8 units men, ≥6 units women.

Fig 30: Difference between male and female rates of heavy drinking in previous week (SHeS, base = all 16- to 74-year-olds, drinkers)



^a Difference = % of men drinking ≥8 units minus % of women drinking ≥6 units on heaviest drinking day in the previous week.

Child drinking

To ensure comparability between the SHeS, SALSUS and HBSC, analysis within this report is restricted to 13- and 15-year-olds. The SHeS was not designed to monitor drinking behaviour within these age groups specifically and its power to detect corresponding real differences is low: sample sizes are small and the 95% confidence intervals wide. SHeS drinking estimates are also much lower than those reported by the SALSUS and HBSC. Unlike both schools surveys, which are administered in the classroom, the SHeS is administered at home in front of parents. It is likely that children are more liable to under-report their drinking in home interviews out of concern that their parents will see their answers. Although the data from SHeS questions on child drinking have their own particular strengths,³¹ these limitations and space constraints have led to their removal from the next survey (2008–11). They are presented here in the interests of comprehensiveness.

Data for the 2002 and 2004 sweeps of the SALSUS were collected later in the school year (spring term) than in previous national school surveys, which went into the field during the autumn term. The slightly older age of pupils and maturation throughout the school year may have had an independent effect on estimates and limits comparability over the time series.

Experience of alcohol

In 2002, the HBSC survey changed the wording of its question on experience of alcohol from 'Have you ever tasted an alcoholic drink?' to 'At what age did you first drink alcohol (more than a small amount)?'. Subsequent data are therefore not comparable with those from previous sweeps of the survey. However, the new question is better able to distinguish between children who have simply tasted alcohol and those who have had a proper alcoholic drink, and is therefore more comparable with corresponding estimates from the SHeS and SALSUS, which ask 'Have you ever had an alcoholic drink – a whole drink, not just a sip?'.

Age differences

Significantly more 15-year-olds have drunk alcohol than 13-year-olds. This finding is consistent across all three child surveys, over time and for both boys and girls (Figures 31–33). Figures vary from survey to survey but those from the 2002 and 2004 SALSUS and the 2002 HBSC agree closely. They indicate that around 66% of 13-year-olds and nearly 90% of 15-year-olds have tried alcohol ('more than a small amount'/'a whole drink, not just a sip').

Gender differences

There is little evidence of a gender difference in the proportion of 13- and 15-year-olds who have drunk alcohol. The only significant difference was observed in the SALSUS, which showed that girls were more likely to have drunk alcohol than boys of the same age. However, the difference was small: 86% and 87% of boys in 2002 and 2004 respectively, versus 90% of girls in both years.

Time trends

Changes to survey methodology (timing of SALSUS fieldwork and revised HBSC question wording) and a lack of agreement in the results between surveys make it very difficult to draw any general conclusions about trends over time in children's experiences of alcohol.

Significantly more 13-year-old girls reported having tried alcohol in the 2002 and 2004 sweeps of the SALSUS than in the 1998 sweep. However, similarity between the 1998, 2000 and 2006 estimates suggests that this finding is explained by the slightly later fieldwork and older samples in the 2002 and 2004 surveys.

The percentage of 15-year-olds reporting experience of alcohol was 10% higher in the 2003 SHeS compared to 1998. This difference was not statistically significant but the survey has little power to detect statistically significant differences when the data are disaggregated to 1-year age bands.

The reduction in the 2002 HBSC estimates, consistent across all four age and sex subgroups, is likely to be explained by the revised question wording introduced in this sweep of the survey. Results from the 2006 survey, scheduled for publication in 2008, will be helpful in determining whether there has been any recent real change in the age at which children first try alcohol.

Fig 31: Percentage who have had a proper alcoholic drink (SHeS, base = all 13- and 15-year-olds)

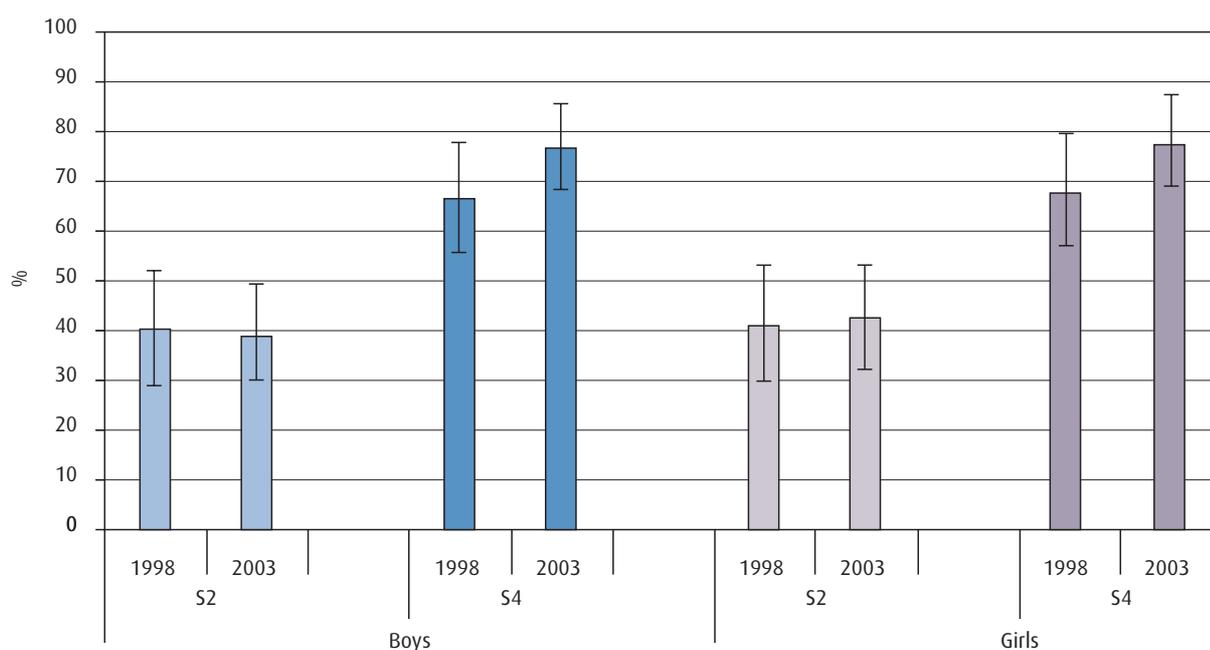
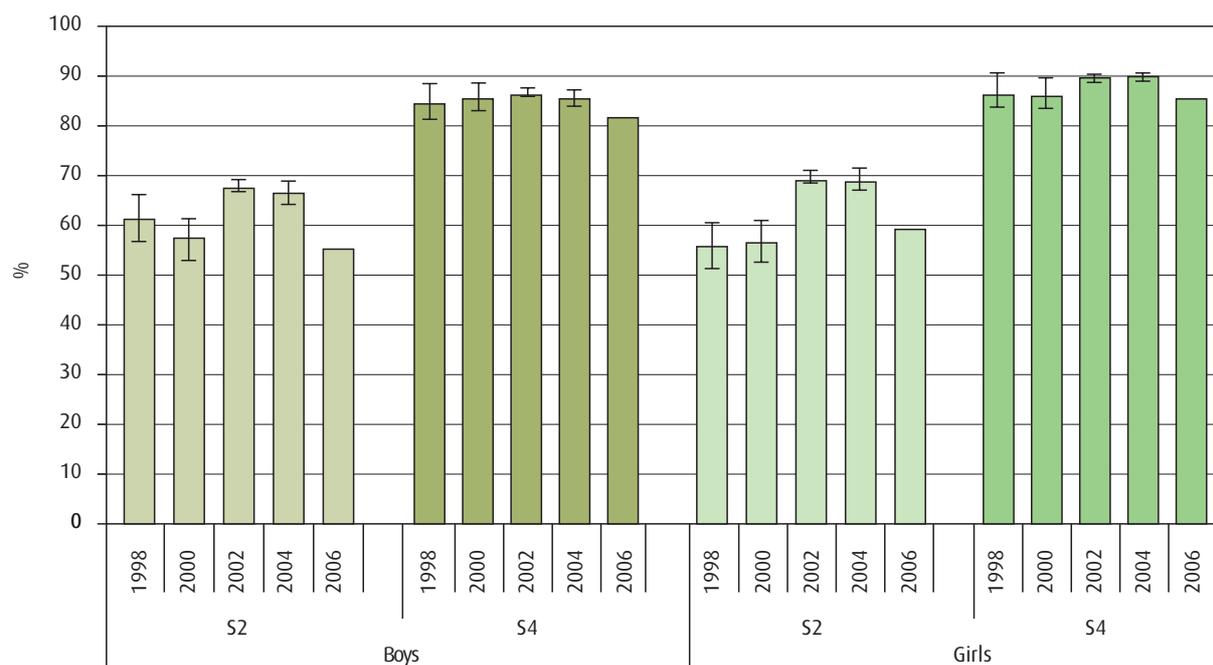
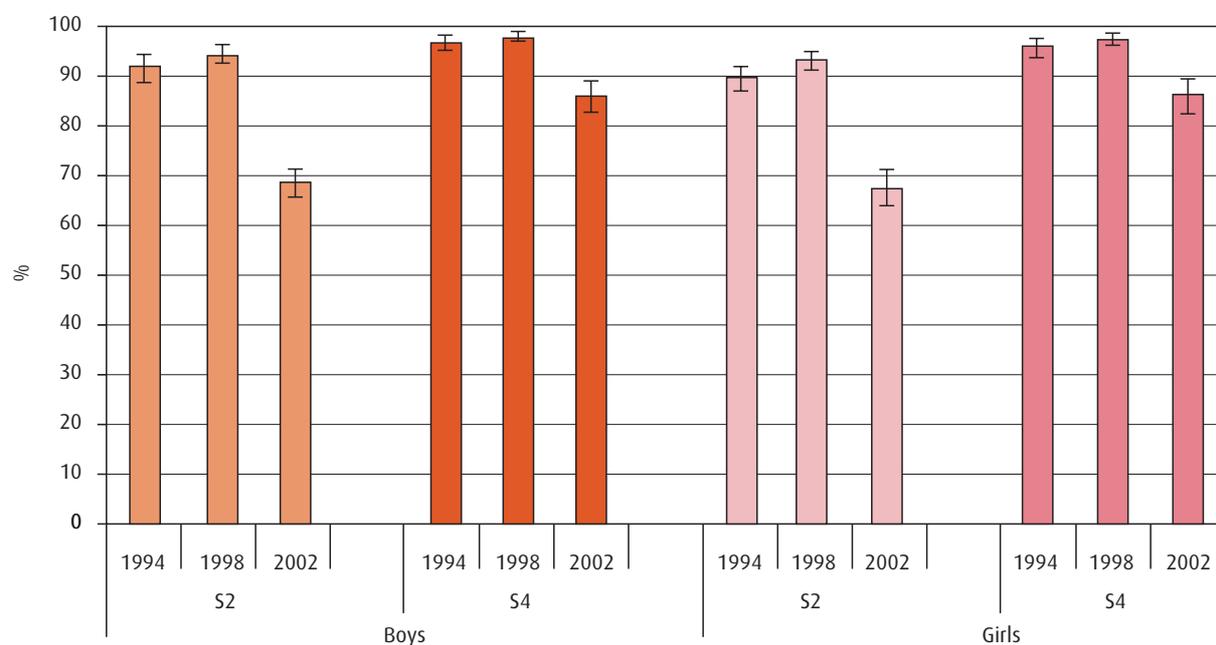


Fig 32: Percentage who have had a proper alcoholic drink (SDDUYT/SDDUYP/SALSUS, base = all 13- and 15-year-olds)



The 2006 figures are from Table 3.1 of the 2006 SALSUS national report³² – the data are not analysed here as the dataset is not yet publicly available.

Fig 33: Percentage who have had a proper alcoholic drink (HBSC, base = all 13- and 15-year-olds)



In 2002, question wording was changed from 'Have you ever tasted an alcoholic drink?' to 'At what age did you first drink alcohol (more than a small amount)?'.

Frequency of drinking

Age differences

Significantly more 15-year-olds than 13-year-olds drink once a week or more. This finding is true of boys and girls and in all sweeps of the HBSC, SALSUS and its forerunners (Figures 34 and 35). Estimates from these surveys suggest that around 20% of 13-year-olds and 30–40% of 15-year-olds drink once a week or more.

The SHeS found no significant differences in drinking frequency between age groups or genders, or over time, although the sample sizes within 1-year age bands are very small (Figure 36).

Gender differences

The HBSC, SALSUS and previous national school surveys provide weak evidence of a gender difference in drinking frequency. Estimates of the proportion drinking once a week or more tend to be lower in girls, but only three out of a total of fourteen comparisons were statistically significant and the order of difference (up to 8%) was reasonably small.

Time trends

The number of children who drink regularly is an indicator for the reduction of harmful drinking by children and young people, a key policy priority for Scotland's action on alcohol.¹⁸ Significantly more boys and girls of both ages drank once a week or more in the 2002 and 2004 sweeps of the SALSUS than in the previous surveys in 1998 and 2000. These changes could be explained in part by the slightly later fieldwork and older samples in 2002 and 2004, but published figures from the 2006 survey³² suggest that a real change has also occurred; 2006 estimates are slightly lower than those from 2002 and 2004 (with the exception of 13-year-old girls, for whom the estimate is higher than that from 2004 but lower than that from 2002) but all are higher than those from 1998 and 2000. As the SALSUS national report³² describes results over time within each age group for boys and girls combined (see Table 3.12 in that report), it is unclear whether the 2006 estimates are significantly higher than those pre-dating the change to fieldwork timing. Once the data become publicly available, analysis should be undertaken within each of the four subgroups.

The HBSC study supports a change in drinking frequency among 15-year-old girls. The proportion that drank once a week or more was significantly higher in 1998 and 2002 than in 1994. Results from the 2006 survey will be helpful in determining whether a genuine change in drinking frequency has occurred amongst young people.

Fig 34: Percentage who drink alcohol once a week or more (HBSC, base = all 13- and 15-year-olds)

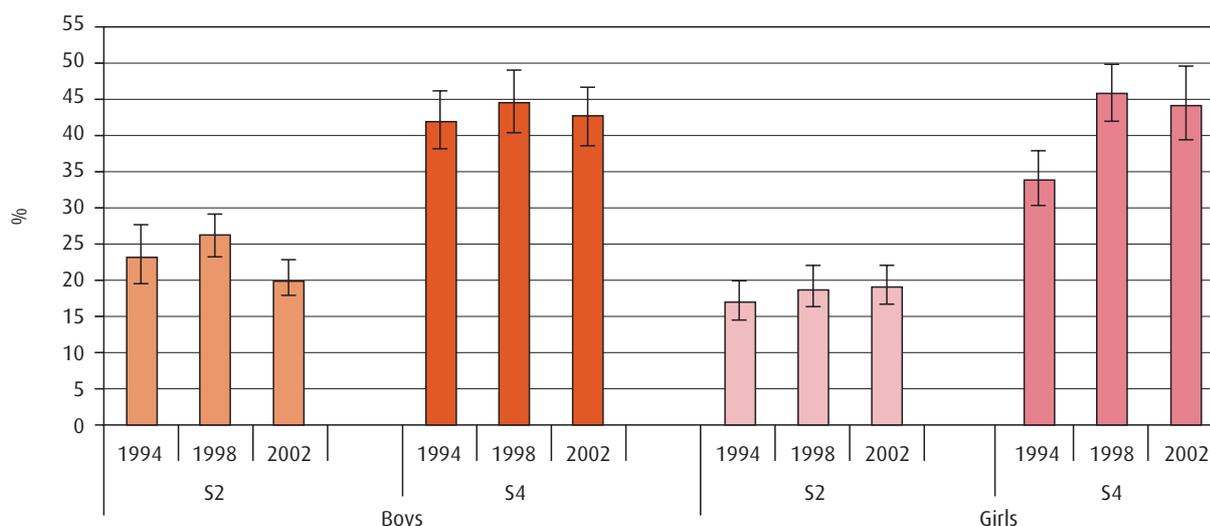
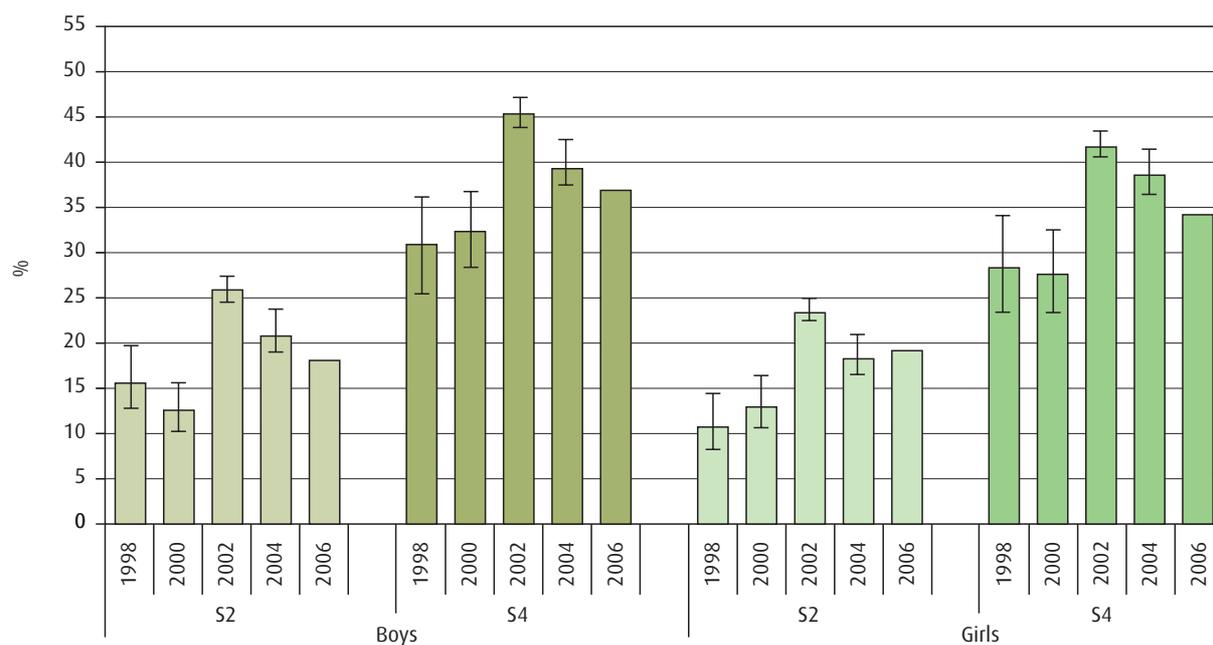
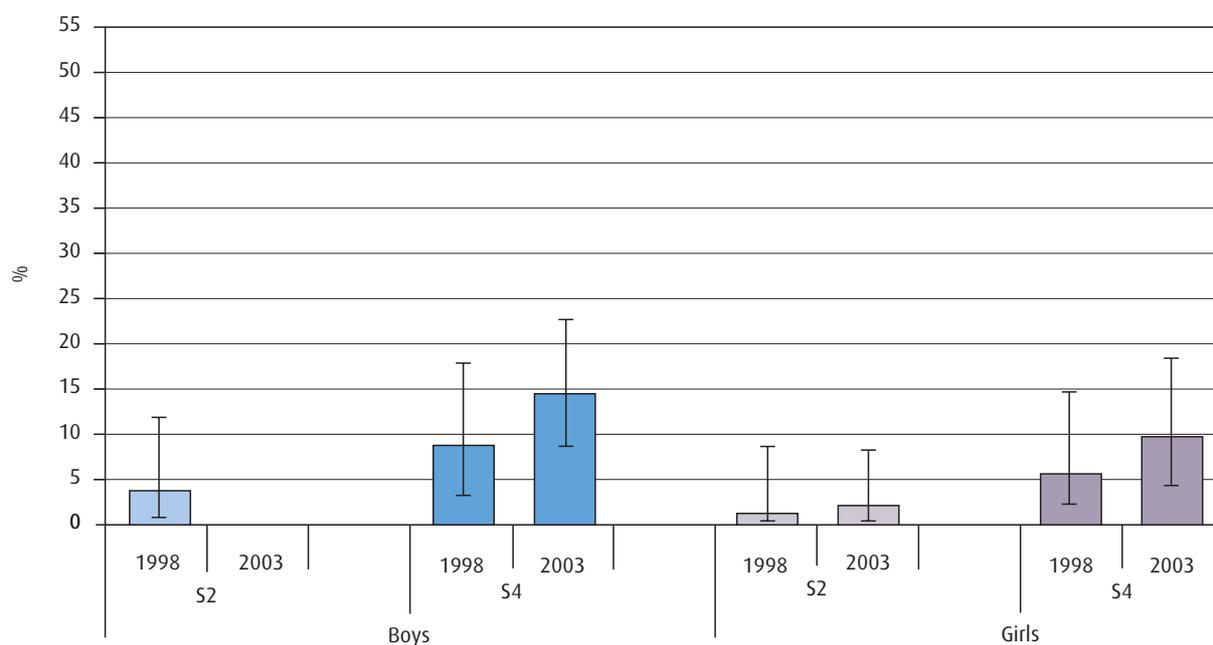


Fig 35: Percentage who drink alcohol once a week or more (SDDUYT/SDDUYYP/SALSUS, base = all 13- and 15-year-olds)



The 2006 figures are from Table 3.10 of the 2006 SALSUS national report³² – the data are not analysed here as the dataset is not yet publicly available.

Fig 36: Percentage who drink alcohol once a week or more (SHeS, base = all 13- and 15-year-olds)



Experience of drunkenness

Limited data are available on the experience of drunkenness in children and young people. Only the HBSC and SALSUS, but not previous surveys in the series, cover this aspect of drinking (Figures 37 and 38). Results have been analysed for the HBSC series only as the 2002 SALSUS dataset lodged with the UK Data Archive does not contain data for this question and the 2006 dataset is not yet available. Estimates are not displayed for the 2002 and 2006 surveys as the published time series (see Table 3.14 in the 2006 national report³²) uses *all pupils who have drunk alcohol* as the denominator, rather than *all respondents*, which was chosen here.

Age and gender differences

Estimates from the 2004 SALSUS and HBSC series suggest that just over one-third of 13-year-olds and just over two-thirds of 15-year-olds have been drunk on at least one occasion. Experience of drunkenness is significantly higher among 15-year-olds than 13-year-olds but there is little evidence of a gender difference.

Time trends

Time trend data from the HBSC series do not provide any evidence of recent change in the proportion of 13- and 15-year-olds who have drunk to excess. Pupils were just as likely to report having been drunk at least once in each of the three surveys conducted between 1994 and 2002.

Fig 37: Percentage who have been drunk at least once (HBSC, base = all 13- and 15-year-olds)

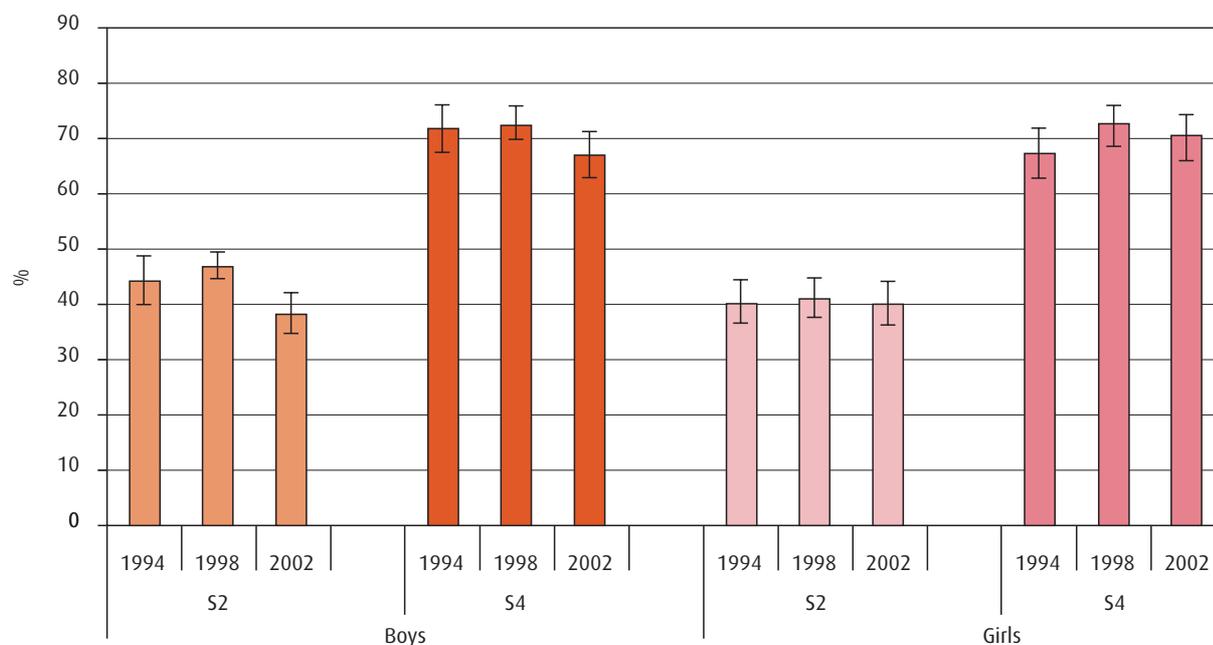
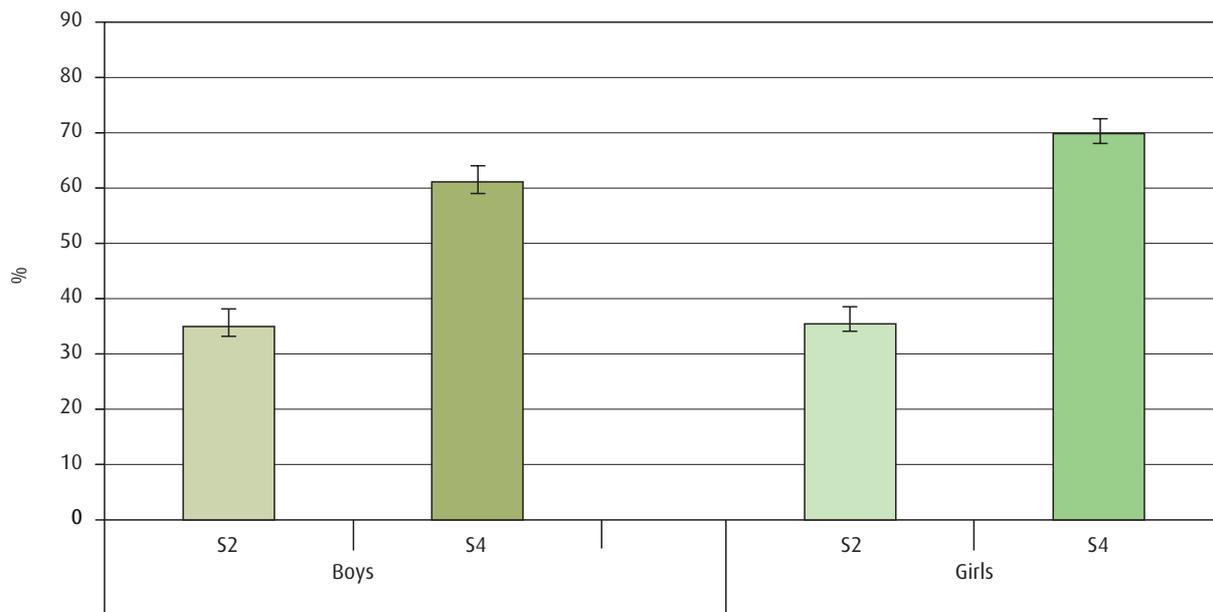


Fig 38: Percentage who have been drunk at least once (SALSUS 2004, base = all 13- and 15-year-olds)



Average weekly consumption

To date, only the SALSUS and SHeS have measured volume of alcohol intake amongst children and young people in Scotland. As drinking questions have been discontinued from the next SHeS (2008–11) for under-16s, the SALSUS is now the sole source of monitoring data for this measure.

Both surveys employed a variant on the 7-day drinking diary method, in which, for each type of alcohol, respondents are asked to recall total intake over the previous week, rather than reporting intake separately for each day.

SHeS estimates of weekly alcohol intake are consistently lower than those from the SALSUS. As mentioned earlier, the SHeS is administered at home in front of parents, which may have caused children to under-report throughout the drinking module as a whole. Two other factors are likely to have affected estimates of alcohol consumption in the SHeS specifically. First, unlike the SALSUS, the survey did not use graphical aids to illustrate typical serving size; as young people may not be familiar with standard pub measures, its estimates of volume are liable to be subject to greater error. Second, in its questionnaire for 13- to 15-year-olds the SHeS did not distinguish between normal strength and strong beer/lager/cider; the SALSUS does not record consumption separately but it does ask respondents if they usually drink normal strength or strong beer (it does not differentiate between normal strength and strong lager or cider). True levels of alcohol consumption amongst children and young people are therefore likely to be closer to estimates from the SALSUS, but survey underestimation of alcohol intake means that they will be higher than even it suggests. Taking account of the variation in alcoholic strength, Goddard³³ noted that surveys in the late 1980s were likely to underestimate alcohol consumption by about one-fifth in young men and one-tenth in young women aged from 16- to 24-years-old. As typical strengths have increased since then (see Figure 9), conversion factor-related underestimation will be even greater now. Other sources of survey underestimation will further add to these figures.

Throughout this section, SALSUS data were analysed in two different ways: using *all survey respondents* and using *those who drank in the previous week* as the denominator. As it includes those who have no experience of alcohol and those who did not drink in the week before the survey, the first approach understates consumption among children and young people who drink regularly. However, it usefully takes account of any fluctuation over time in the proportion of children who drank in the previous week, and thereby of experience of alcohol and drinking frequency. In 2004, around 20% of SALSUS respondents aged 13 reported drinking in the previous week (Figure 39). For 15-year-olds, this figure rises to almost 40% of boys and almost 50% of girls.^{viii}

SHeS data on alcohol consumption were not analysed because of the very small numbers of children and young people who reported that they had drunk alcohol in the previous week (Table 5) and the ensuing uncertainty in estimates (Figures 40 and 41).

Table 5: Unweighted bases for average weekly consumption: number who drank in the previous week

		SHeS		SALSUS			
		1998	2003	1998	2000	2002	2004
S2	Boys	11	4	24	73	1380	344
	Girls	8	5	25	80	1458	338
S4	Boys	26	24	156	200	2444	644
	Girls	20	18	154	175	2397	775

^{viii} As would be expected, the distribution of respondents who drank in the previous week is very similar to the proportion that reported drinking alcohol once a week or more (Figure 35).

Fig 39: Percentage of children who drank alcohol in the previous week (SDDUYT/SDDUYP/SALSUS, base = all 13- and 15-year-olds)

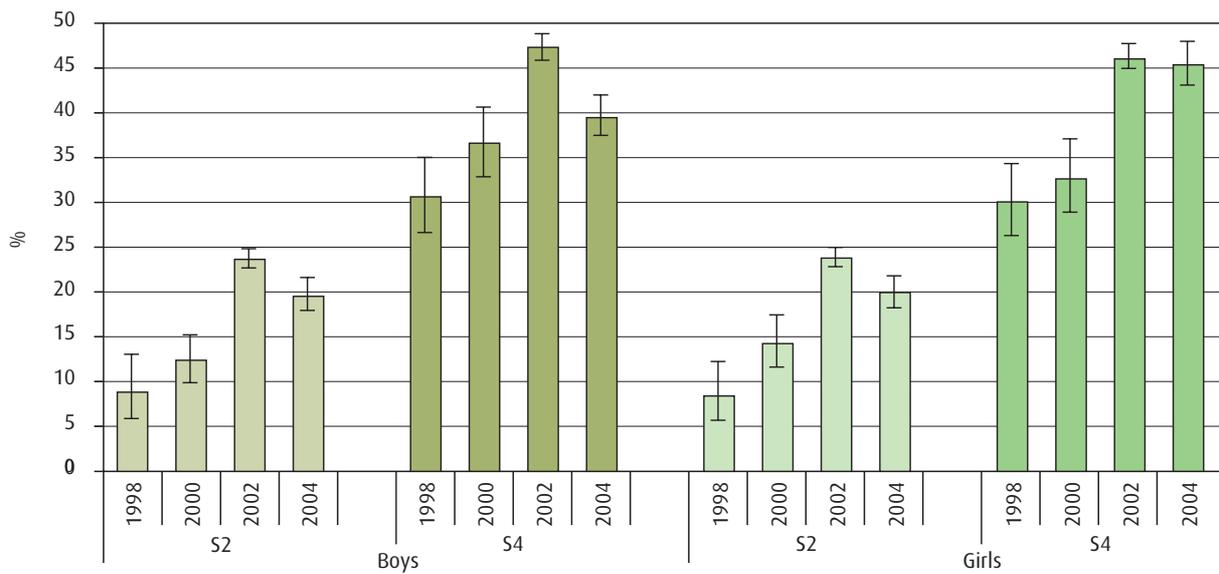


Fig 40: Average weekly alcohol consumption (SHeS, base = all 13- and 15-year-olds)

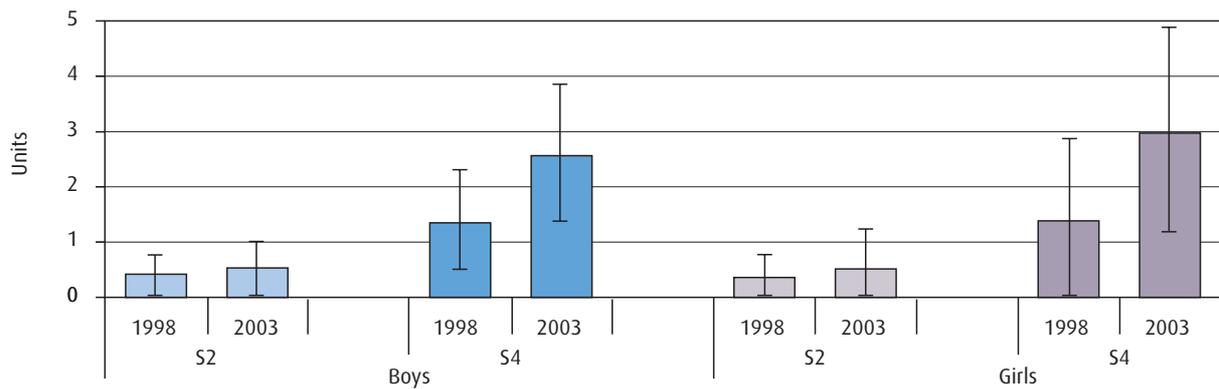
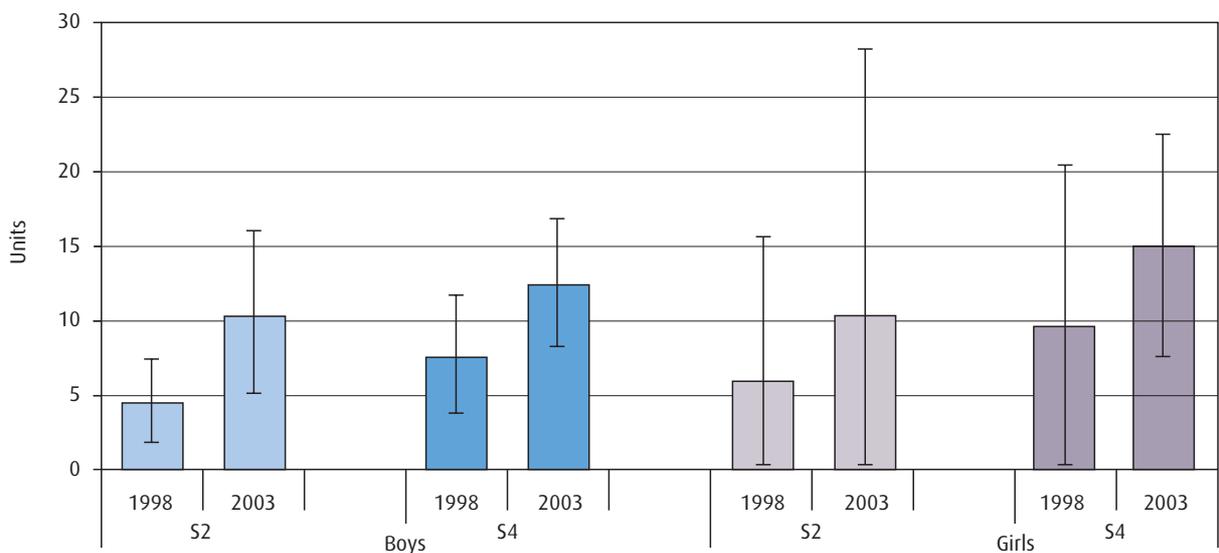


Fig 41: Average weekly alcohol consumption among those who drank in the previous week (SHeS, base = all 13- and 15-year-olds)



Age differences

The SALSUS and previous national school surveys provide strong evidence of a difference in weekly alcohol consumption between 13- and 15-year-olds (Figure 42). Estimates of weekly alcohol consumption are significantly higher in 15-year-old boys and girls than in 13-year-olds in all four sweeps of the survey between 1998 and 2004. In 2004, 13-year-olds drank an average of 2 units of alcohol per week, 15-year-old boys 6 units per week and 15-year-old girls 5 units per week.

In 2004, boys who drank in the previous week consumed an average of 11 units of alcohol at age 13 and 14 units at age 15 (Figure 43). Girls who drank in the previous week consumed an average of 9 and 11 units at ages 13 and 15 respectively. Again, there was strong evidence of higher intake amongst the older age group.

Gender differences

There is some evidence from the SALSUS that 15-year-old girls drink less on average than boys of the same age (Figure 42). The evidence is stronger when those who did not drink in the last week are excluded from analysis – for those who drank in the last week, 15-year-old girls drank significantly less than boys of the same age in all years of the survey except for 1998 (Figure 43).

Time trends

Using all respondents as the denominator, estimates of weekly alcohol intake among teenage girls from the 2002 and 2004 sweeps of the SALSUS are significantly higher (+1 unit per week for 13-year-olds and +2 units per week for 15-year-olds) than those from 1998 and 2000 (Figure 42). When those who did not drink in the last week were removed from the analysis (Figure 43), alcohol intake remained significantly higher among 13-year-old girls in 2002 and 2004 than in 1998. These results might be explained by the change to fieldwork timing and slightly older samples in 2002 and 2004, but it is impossible to tell from the published 2006 estimates as the addition of fortified wine^{ix} to the questionnaire prevents direct comparison with previous surveys. Reanalysis of the time series, *excluding* fortified wine consumption, is required to determine whether any real change has occurred.

Between 1998 and 2004 there was little evidence of any change in mean alcohol intake among teenage boys overall and no significant change among those who drank in the previous week. Failure to update conversion factors might conceal a real increase over this time frame. Similarly, the level of real change among girls may be greater than observed. However, as children and young people drink less wine,^x associated with the greatest underestimation of unit content,²⁸ the effect on time series will be less pronounced than with adults. Recalculation of existing data (using updated conversion factors and, when possible, estimates of serving size) will provide a clearer picture of actual levels of consumption and change over time.

^{ix} Pupils were asked 'During the last 7 days, how much fortified/dessert or tonic wine have you drunk? This includes drinks such as: MD 20/20; Buckfast; Thunderbird; Port. This type of wine is stronger and sweeter than ordinary wine. Please do not include sherry here.' This question was asked in addition to the previous ones on consumption of Martini and sherry and ordinary table wine.

^x Among 13- and 15-year-olds, the most popular drinks are spirits/liqueurs, alcopops and beer/lager/cider.³²

Fig 42: Average weekly alcohol consumption (SDDUYT/SDDUYP/SALSUS, base = all 13- and 15-year-olds)

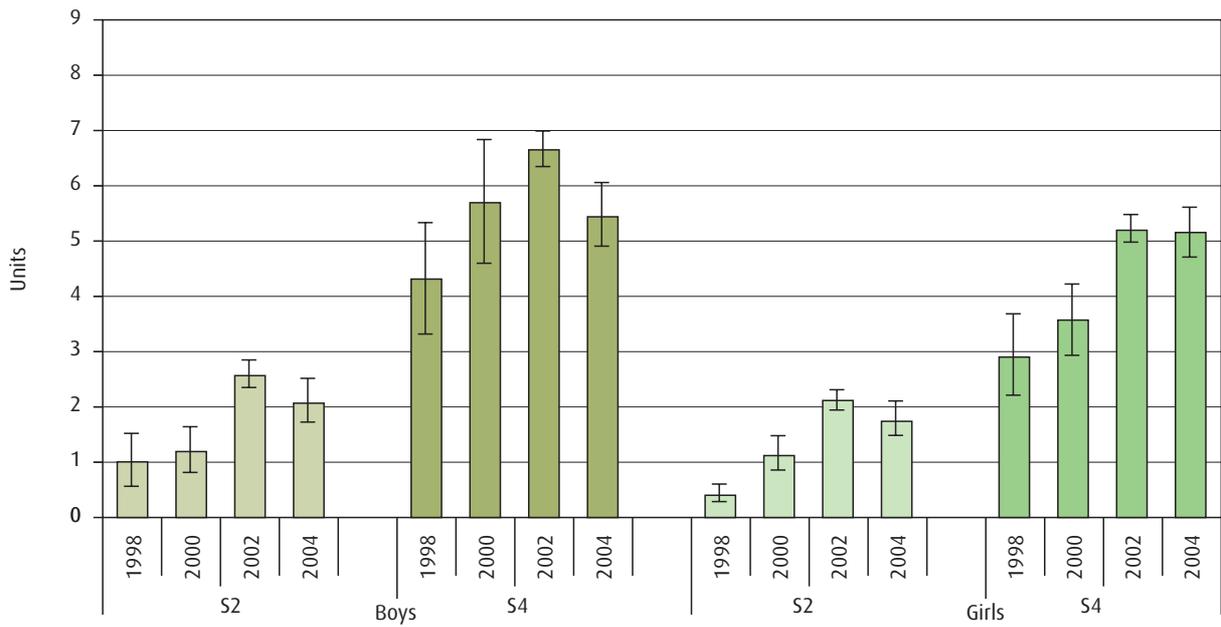
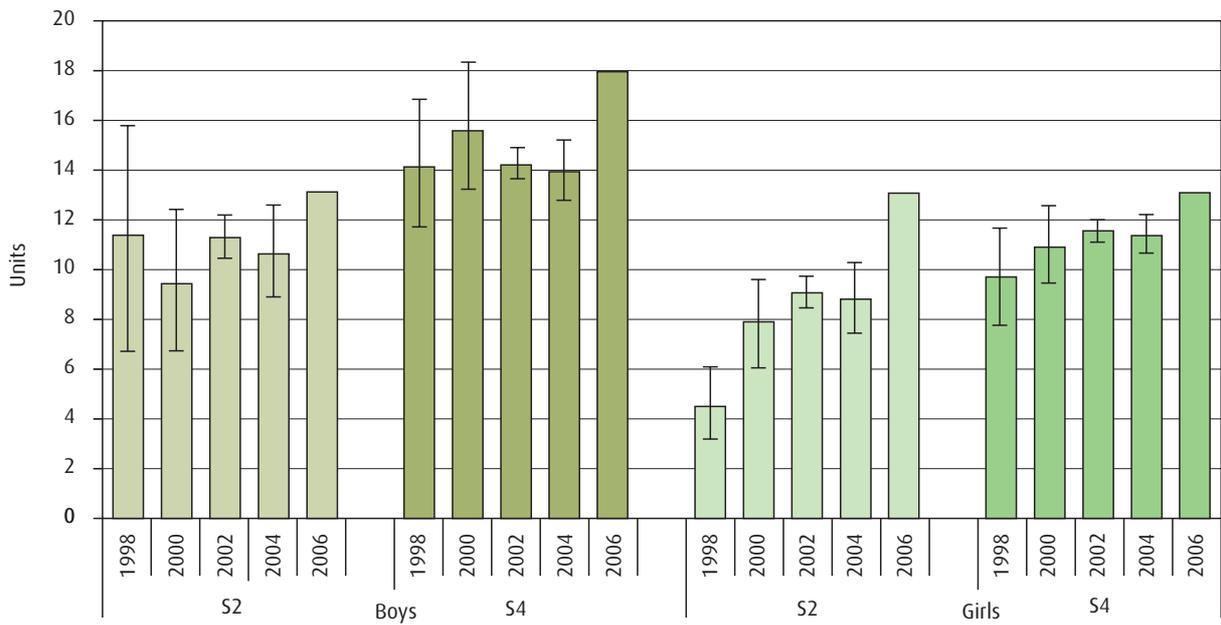


Fig 43: Average weekly alcohol consumption among those who drank in the previous week (SDDUYT/SDDUYP/SALSUS, base = all 13- and 15-year-olds)



The 2006 figures are from Table 3.8 of the 2006 SALSUS national report³² – data not analysed here as the dataset is not yet publicly available.

Conclusions

Validity

- Comparison with UK sales estimates of alcohol intake suggests that surveys may understate alcohol consumption by as much as 50%.
- To provide a more nationally representative estimate, it would be extremely valuable if UK sales data could be disaggregated to give separate data for Scotland.
- Scotland now commissions only one survey to assess alcohol consumption in adults (SHeS) and one in children (SALSUS). Reliance on a single source for each target group places greater emphasis than ever before on the choice of drinking methodology and robustness of estimates.
- Scotland's routine national surveys have underestimated serving sizes of wine and spirits.
- Scotland's routine national surveys have underestimated the alcoholic content of wine, beer, lager and cider.
- The gap between sales and survey estimates of alcohol consumption has widened over time indicating increasing survey underestimation of alcohol intake. The clearest explanation is provided by increases in the typical size and strength of some drinks, which have not been accounted for by surveys.
- Progressively increasing survey underestimation of alcohol intake means that existing time trend data may be misleading in terms of real population change.
- The reduction of excessive drinking is a key indicator of Scottish alcohol policy, yet surveys do not use the best available method to assess episodes of higher than usual consumption.

Trends

- Trend data from the last decade suggest a modest reduction in male drinking and either stability or an increase in female drinking. However, this does not take account of increased survey underestimation of alcohol intake.
- Trends are less clear for children and young people and are more difficult to interpret because of changes to survey methodology; however, they suggest no change in the age at which children first try alcohol. There is provisional evidence of an increase in teenage drinking frequency, particularly amongst girls. Girls may also be consuming alcohol in larger amounts than in the late 1990s, but further analysis is required to determine whether this effect is real or due to revised survey methodology.
- Progressively increasing survey underestimation of alcohol intake complicates the interpretation of trends in alcohol consumption. Survey reports of reduction or stability may conceal real increases, and apparent increases will be much greater than observed. As undercounting of alcoholic content has been greatest for wine, distortion of trends will be most pronounced amongst those most likely to be wine drinkers (women, those aged 25 and older and the most affluent).

Recommendations for improving survey estimates of intake

- Survey assumptions on drink size should be updated using empirically based estimates of typical drink size.
 - Surveys should provide a range of options for size of drink that are representative of both the glass and container sizes actually available to consumers and the drinking styles within the survey target group.
 - To improve the accuracy of estimates in children and young people, consideration should be given to asking them to report volume of intake in fractions of bottles rather than in glasses.
 - In view of substantial variation in the size of home and pub measures of wine and spirits, the scope for setting-specific conversion factors should be explored.
- Survey assumptions on drink strength (i.e. alcohol conversion factors) should be updated using empirically based estimates of typical drink strength.
- Because of rapid changes in the drinks market, survey assumptions on drink size and alcohol conversion factors should be regularly reviewed and updated, preferably annually.
- To provide a more accurate picture of trends over time, consideration should be given to re-calculating the existing time series using updated conversion factors and estimates of drink size for each year's data.^{xi}
- In view of current concerns about excessive drinking, consideration should be given to replacing survey questions on heaviest drinking day with the graduated quantity–frequency approach, recognised as the best method to assess periods of greater than usual consumption.
- The availability of Scotland-level alcohol sales data should be explored.

^{xi} Already in progress for the SHeS.

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Appendix A: Overview of Scotland's routine national surveys providing data on alcohol consumption

	Scottish Health Survey (SHeS)	Health Education Population Survey (HEPS)	Health Behaviour in School-Aged Children (HBSC)	Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS)
Organisation responsible	Scottish Government Health Department	NHS Health Scotland	Child & Adolescent Health Research Unit, University of Edinburgh. Funded by NHS Health Scotland	Funded by the Scottish Government, project managed by Information Services Division Scotland
Background and purpose	Aims to estimate the prevalence of health conditions and health-related behaviours, with a particular focus on cardiovascular disease and related risk factors. The survey also aims to monitor progress towards the Scottish Government's health and dietary targets. The survey now provides trend data going back almost a decade; providing a time series has become an important function of the survey	The HEPS monitored health-related knowledge, attitudes, behaviours and motivations to change among the adult population in Scotland. The main purpose of the survey was to monitor the influence of health education, information and communications activities upon measures in these four areas	HBSC is a cross-national research study which aims to increase our understanding of young people's health and wellbeing, health behaviours and their social context. Thirty-four countries participated in the 2002 survey and forty-one in 2006. Data collection is undertaken using a common research protocol	SALSUS was established to provide a broad-based approach to the monitoring of substance use among young people in Scotland. The survey is designed to gather information for local as well as national level reporting and provides local level information to drug and alcohol action teams, NHS boards and local authorities
Survey years/frequency	Every 3–5 years. To date, surveys have been carried out in 1995, 1998 and 2003	Annually, from 1996 to 2007. Fieldwork was undertaken twice each year – a spring and an autumn wave – and the data combined to produce annual estimates. The survey was suspended for three waves during 1999–2000 so that the 1999 estimates are based on a sample size half of that usually obtained and there are no estimates for 2000	The first cross-national HBSC survey was conducted in 1984 and the second in 1986. Since then data collection has been carried out every four years. Scotland participated for the first time in 1986. The most recent survey, the seventh in the series, was conducted in 2006 but results are only presented up to 2002 as those from the most recent survey were not available at the time of writing	SALSUS began in 2002 and is conducted every two years. However, results are only presented up to 2004 as data for the 2006 survey was not available for analysis at the time of writing. The SALSUS continues a biennial series of national school surveys from 1982
Dates of fieldwork	March 1995–February 1996; April 1998–April 1999; June 2003–December 2004	Fieldwork was usually undertaken in March and September of each year; however, the 2006 spring wave was accelerated to January in order to provide baseline data for evaluation of the smoking ban. To ensure consistency, the 2007 spring wave, which provided follow-up data for the smoking ban evaluation, was also undertaken in January	Fieldwork is usually undertaken in February–March although it has been slightly accelerated or delayed in specific years. In 1994, questionnaires were re-issued with slight changes to content and data collection therefore extended until June. In 2006, fieldwork began in January	Data collection for the 2002 and 2004 surveys was undertaken from February–April. Data collection for the 2006 survey was undertaken from September–December. Fieldwork for the previous national school surveys was undertaken from September–November, almost six months earlier than the 2002 and 2004 SALSUS
Survey content	The survey consists of a Stage 1 interview that includes questions on general health, cardiovascular disease, respiratory symptoms, eating habits, smoking, drinking, physical activity and accidents as well as height and weight measurements. Respondents are asked if they would consent to a Stage 2 nurse visit. The nurse visit incorporates further questions; measures of blood pressure, additional anthropometrics and lung function; saliva and blood samples; a urine sample or an electrocardiogram reading on a sub-sample of respondents	The survey included questions on knowledge, attitudes, motivation and behaviour/health status in relation to the following topics: attitudes towards own health, physical activity, diet, smoking, alcohol, mental health, drug use and sexual health	The survey collects information on self-reported health and wellbeing, smoking, alcohol, cannabis use, physical activity and sedentary behaviour, eating habits and body image, oral health, bullying and fighting, injuries and sexual health. The survey also collects information on the life circumstances of young people including family, school, peers and socioeconomic circumstances. These are seen as the key social contexts related to the health and health behaviour of young people	The survey collects information on the prevalence and patterns of smoking, drinking and drug use among secondary school children in Scotland. It includes questions about the availability and sources of supply of cigarettes, alcohol and drugs. It also includes questions on family circumstances, parental knowledge and monitoring of children's activities, and how much money children have to spend as they like
Target population	People living in private households in Scotland. The age range for the 1995 survey was adults aged 16 to 64. In the 1998 survey the age range was extended to people aged between 2 and 74 years old. In the 2003 survey the age range was extended again and the survey included children aged 0 to 15 and adults aged 16 and over	Adults aged 16 to 74 living in private households in mainland Scotland	Young people attending school, aged 11 (P7), 13 (S2) and 15 (S4) years old	The target population is all pupils in S2 and S4 in Scotland and pupils are mainly 13 or 15 years of age at the time of the survey. All local authority and independently funded schools with pupils in the target age groups are eligible for inclusion in the survey, with the exception of special schools
Sample size	In the 2003 survey, around 14,000 addresses were selected for inclusion in the survey. Two samples were selected for the survey: a general population (main) sample in which all adults and up to two children were eligible for selection in each household; and a child boost sample in which up to two children were eligible to be selected in additional households. The child boost sample was to ensure that sufficient numbers of children were included in the sample overall. There were 8,148 individual interviews with adults and, of these, 5,444 saw a nurse. Interviews were carried out with 3,324 children and a nurse saw 2,224 children	Each survey wave had an achieved sample of approximately 900 people, giving an annual number of achieved interviews of around 1,800	The survey is carried out on a nationally representative sample in each participating country. The sample in each country consists of approximately 1,500 children from each age group, giving a total sample size of 4,500 children	The 2004 survey produced a total of 7,062 completed questionnaires. In total, 340 classes in 194 schools participated in the survey
Response rate	In 2003, the response rate for the Stage 1 interview was 60% among adults and 72% among children	Approximately 70%	The overall response rate for the 2001/02 HBSC survey in Scotland was 65%	The overall response rate for the 2004 survey was 62%
Method of data collection	Interviews are conducted using computer-assisted personal interviewing (CAPI). Permission is also sought for a follow-up nurse visit. The nurse asks some further questions and takes some measurements (e.g. blood pressure, lung function, waist and hip measurements, and blood and saliva samples)	The survey was administered using computer-assisted personal interviewing (CAPI) with more sensitive information on topics such as mental health, sexual health and drug use obtained by self-completion	HBSC is a school-based survey with data collected through self-completion questionnaires administered in the classroom. All participating countries use a standard questionnaire	The survey is conducted in schools using a class-based design. All pupils in selected classes are asked to complete a confidential questionnaire
Smallest geographical unit reported	The 2003 survey was designed to provide data at both national and regional level. This was also the case for the 1995 and 1998 surveys. The regions were based on aggregating neighbouring health boards into seven areas (Highland and Islands; Grampian and Tayside; Lothian and Fife; Borders, Dumfries and Galloway; Greater Glasgow; Lanarkshire; Ayrshire and Arran; Argyll and Clyde, Forth Valley). The regional analysis has not been included in the 2003 final report. However, a series of health board tables, including some of the key indicators presented in the report, is available online	Scotland	Scotland	Scotland, NHS boards, Alcohol and Drug Action Teams, local authorities

	Scottish Health Survey (SHeS)	Health Education Population Survey (HEPS)	Health Behaviour in School-Aged Children (HBSC)	Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS)
Target group	All informants aged 8 and above	All informants, i.e. adults aged 16 to 74 years	All informants, i.e. P7 (11-year-olds), S2 (13-year-olds), S4 (15-year-olds)	All informants, i.e. S2 (13-year-olds), S4 (15-year-olds)
Measures	<p>Adults (16+):</p> <ul style="list-style-type: none"> Usual weekly consumption in last year Usual frequency of drinking in last year Consumption on heaviest drinking day in previous week Problem drinking including physical dependency For the first time, the 2003 survey included questions on the social context of drinking (where respondents usually are when they drink and who they usually drink with) <p>Children aged 8–12:</p> <ul style="list-style-type: none"> Experience of alcohol (ever tried alcohol, age at first drink) Usual frequency of drinking When last had a drink <p>Children aged 13–15:</p> <p>As for those aged 8–12, plus the following if had a drink in the previous week:</p> <ul style="list-style-type: none"> Alcohol consumption in previous week For the first time, the 2003 survey included questions on the social context of drinking (where usually drink and who usually drink with). However, information on place was not analysed by the survey as very few children aged 13–15 had drunk alcohol in the previous week 	<ul style="list-style-type: none"> Frequency of drinking in last year Weekly consumption, if had a drink in previous week Awareness of measuring alcohol in 'units' Knowledge of recommended limits (respondent could express in terms of weekly and/or daily and/or other limits) Binge drinking in the previous month (men were asked how many times they have drunk 16 units or more and 8 units or more on one occasion in the last month, women were asked how many times they have drunk 10 units or more and 6 units or more) Self-perceived drinking status (graded from 'very light' to 'very heavy' drinker) 	<p>P7:</p> <ul style="list-style-type: none"> Frequency of drinking beer, wine, spirits, alcopops, cider, fortified wine, other types of alcohol Experience of drunkenness (number of times been drunk) <p>S2 & S4:</p> <p>As for P7, plus the following:</p> <ul style="list-style-type: none"> Experience of alcohol (age at first drink) Experience of drunkenness (age first got drunk) 	<ul style="list-style-type: none"> Experience of alcohol (ever tried alcohol) Usual frequency of drinking When last had a drink Alcohol consumption in previous week, if had a drink in the previous week Experience of drunkenness (number of times been drunk, drunkenness in the last 7 days) Binge drinking in the last 30 days (five or more drinks on the same occasion) Experience of harmful behaviour/other harmful effects from drinking Social context of drinking (where usually are when drink, who usually drink with) Number of friends who drink alcohol Alcohol purchase Family attitudes to drinking Perceptions towards television alcohol adverts
Mode of administration	<p>Adults aged 18+:</p> <p>Face-to-face interview except for CAGE questions on problem drinking, which are self-completed</p> <p>Adults aged 16–17:</p> <p>Self-completion. Interviewers had the option of using the self-completion booklet for this age group with 18–19 year olds at their discretion</p> <p>Children aged 8–15:</p> <p>Self completion. Different self-completion booklets, with different questions, for those aged 8–12 and 13–15</p>	Face-to-face interview administration	Classroom-based self-completion	Classroom-based self-completion
Survey instrument for measurement of alcohol consumption	<p>Adults (16+):</p> <p>Quantity–frequency method (reference period = last year) supplemented with additional questions to assess binge drinking (reference period = previous week). Averaging techniques applied to yearly estimate to measure daily consumption</p> <p>Children aged 13–15:</p> <p>Variation on the 7-day drinking diary method (reference period = previous week but, for each type of drink, respondents are asked to recall total consumption for the week rather than each day at a time)</p>	Variation on the 7-day drinking diary method (reference period = previous week but, for each type of drink, respondents were asked to recall total consumption for the week rather than each day at a time) supplemented with two additional questions to assess frequency of binge drinking (reference period = last month)	Not measured	Variation on the 7-day drinking diary method (reference period = previous week but, for each type of drink, respondents are asked to recall total consumption for the week rather than each day at a time) supplemented with additional question to assess frequency of binge drinking (reference period = last 30 days)
Types of drink	<p>Adults (16+):</p> <ol style="list-style-type: none"> Normal strength beer, lager, stout, cider or shandy Strong beer, lager, stout or cider Spirits or liqueurs Sherry or Martini Wine Alcoholic soft drink ('alcopops') or pre-mixed alcoholic drink Other kinds of alcoholic drink <p>Children aged 13–15:</p> <p>As for 16+ but does not distinguish between normal strength and strong beer, lager or cider and no option for stout</p>	<ol style="list-style-type: none"> Normal strength beer/lager/cider Extra strong beer/lager/cider Martini/sherry/port Spirits or liqueurs Wine Other types of alcohol such as designer drinks or alcoholic lemonade 	NA	<ol style="list-style-type: none"> Beer/lager/cider (also ask if usually drink normal strength or strong beer) Shandy Wine Fortified, dessert or tonic wine Martini and sherry Spirits and liqueurs Alcopops or pre-mixed alcoholic drinks
Assumed serving sizes	<p>Slight differences between questionnaires for different age groups (see 2003 Technical Report²⁶). Eighteen years and older:</p> <ul style="list-style-type: none"> Half-pints, small cans, large cans, bottles of beer/lager/cider/shandy Single measures of spirits or liqueurs Glasses of Martini/sherry/port Glasses of wine Small cans or bottles of alcopops Half-pints, singles, glasses, bottles of other (state) kinds of alcohol 	<ul style="list-style-type: none"> Pints of beer/lager/cider Glasses of Martini/sherry/port Single measures of spirits or liqueurs Glasses of wine Glasses, cans or bottles of other types of alcohol such as designer drinks or alcoholic lemonade 	NA	<ul style="list-style-type: none"> Pints, half-pints, large cans, small cans, bottles beer/lager/cider Pints, half-pints, large cans, small cans shandy Glasses of wine Glasses of Martini and sherry Glasses of spirits or liqueurs ('By a glass we mean a single pub measure') Cans, bottles of alcopops or pre-mixed alcoholic drinks
Assumed alcoholic strength	<p>1 unit:</p> <ul style="list-style-type: none"> Half-pint of normal strength beer/lager/cider/alcoholic soft drink Single measure of spirits 125ml glass of wine Glass of fortified wine <p>1.5 units:</p> <ul style="list-style-type: none"> Half-pint of strong beer/lager/cider 	<p>1 unit:</p> <ul style="list-style-type: none"> Glass of Martini/sherry/port Single measure of spirits or liqueurs Glass of wine Castaway <p>1.5 units:</p> <ul style="list-style-type: none"> Red/Reef/Metz/Hoopers Hooch Vodka Source/Bacardi Breezer/Rigo Red Square/Smirnoff Ice/Mule <p>2 units:</p> <ul style="list-style-type: none"> Pint of normal strength beer/lager/cider Buckfast <p>2.5 units:</p> <ul style="list-style-type: none"> MD 20/20 <p>3 units:</p> <ul style="list-style-type: none"> Pint of extra strong beer/lager/cider 	NA	<p>0.25 units:</p> <ul style="list-style-type: none"> Less than half a pint shandy <p>0.5 units:</p> <ul style="list-style-type: none"> Less than half a pint beer/lager/cider Half-pint/small can or bottle shandy Less than a glass wine/fortified wine/spirits Less than a bottle 'alcopops' <p>0.75 units:</p> <ul style="list-style-type: none"> Large can shandy <p>1 unit:</p> <ul style="list-style-type: none"> Half-pint/small can or bottle beer/lager/cider Pint of shandy Glass wine/fortified wine/spirits Can or bottle 'alcopops' <p>1.5 units:</p> <ul style="list-style-type: none"> Large can beer/lager/cider

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