

Understanding the alcohol harm paradox in order to focus the development of interventions

Final report

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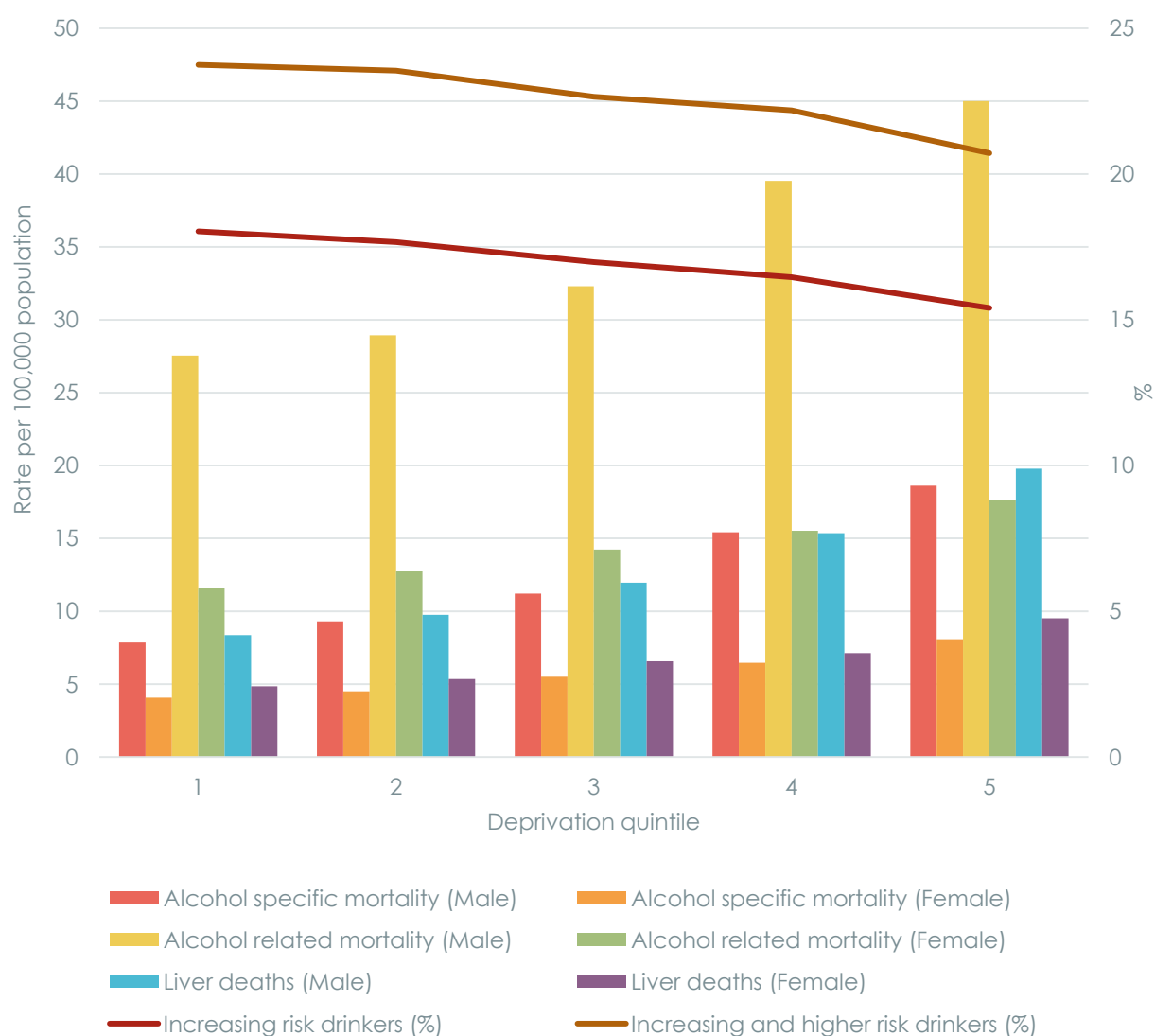
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EXECUTIVE SUMMARY

This report provides an accessible overview and synthesis of the main findings from the project. Scientific and technical discussions are expanded further in the associated scientific outputs referred to in each section, and publication details will be available via the ARUK website.

Policy makers, health and social care professionals, and researchers have long been interested and concerned about the apparent relationship between health and socioeconomic status (SES). SES refers to the position of individuals or groups in society based on a range of social and economic factors that influence this position. Previous research has shown a clear and persistent gradient in the risks of ill health by SES such that those with low personal or neighbourhood SES are much more likely to die or suffer from a range of diseases. This gradient extends to alcohol, low SES is consistently associated with alcohol related disease and mortality. Importantly, consumption patterns tend to show a deviation from the traditional pattern observed for other risky health behaviours, such as tobacco smoking, and SES. For example, data from England and Wales estimates that both males and females in the most socioeconomically deprived communities are 2-3 times more likely to die from an alcohol related condition than those residing in less deprived areas. Regional alcohol use data suggests differences in the volume of alcohol consumed between the most and least deprived women, but not in men, and nationally, both men and women from deprived areas are more likely to be admitted to hospital for reasons related to alcohol. Such findings aren't limited to the UK, and similar data has been reported from other European countries, including Sweden, which is thought to have fewer social and health inequalities than the UK.

This has given rise to a paradox, whereby disadvantaged populations that apparently have the same, or a lower level, of alcohol consumption suffer greater alcohol-related harm than more affluent populations (see Figure below). However, the precise pathways and mechanisms through which SES and alcohol-related harm are associated remain unclear.



Variations in alcohol-related mortality and drinking patterns by deprivation (Local Alcohol Profiles for England, Centre for Public Health, 2012)

A number of explanations have been proposed for why higher levels of alcohol-related harm are experienced in lower socioeconomic groups. For example, by focusing on the characteristics of neighbourhoods (typically measured by the Index of Multiple Deprivation (IMD) in the UK), researchers have sought to determine whether area of residence has an effect on health and health behaviours such as alcohol consumption, and whether this is independent from individual level factors that comprise SES (e.g. education, income, and employment). However, it is likely that there are interactions between individual and area-level SES that affect drinking patterns and problems. We identified three important mechanisms by which neighbourhood deprivation may influence alcohol consumption, and thus health outcomes: (1) neighbourhood resources; (2) stresses in the physical environment and social environment; and (3) social networks and norms. These are briefly considered below.

Differences in health may be partly determined by the resources offered in neighbourhoods. These not only relate to the availability and quality of health and other supportive community services, but also to alcohol retail outlets, and there is some evidence from the UK to suggest that outlet density is higher in areas of greater deprivation¹. However, less certain are the links between outlet density, consumption, and ill health, and there is conflicting international data on this topic.

It is also thought that exposure to socially disordered and potentially threatening environments may activate a physiological stress response that may in turn affect health². In relation to heavy drinking, some researchers have suggested that the stress of living in deprived neighbourhoods and the resulting increase in psychosocial distress may lead to heavy drinking as a means of regulating anxiety and depression ('self medication'). Previous studies have also suggested that particular stressors may be related more strongly to SES gradients in heavy drinking than others.

Finally, the social nature of drinking means that people tend to influence each other's drinking behaviour as well as their own³. Neighbourhood norms about drinking and drunkenness have been found to be distinct aspects of the social environment; and previous research has suggested that neighbourhood norms around drunkenness were strongly associated with heavy drinking⁴.

We synthesised this evidence and have proposed five testable hypotheses to help understand why deprived populations that apparently consume the same or less alcohol than less deprived populations suffer greater levels of harm. We have described this as the 'alcohol harm paradox', and this concept underpins our work:

1. **Under reporting** - The alcohol harm paradox may not in fact be genuine and is instead a result of inaccurate reporting of alcohol consumption. We already know that household alcohol surveys underestimate the amount of alcohol drunk per capita when compared with alcohol sales. Under reporting in surveys may be more likely among people from low socioeconomic groups, because: (a) there may be lower accuracy in reporting consumption; (b) heavy drinkers of low SES may not contribute to surveys; or (c) heavier drinkers are more likely to be both of lower SES and underestimate their consumption. This would mean that in reality low SES drinkers consume more than less deprived drinkers, but this isn't captured by existing surveys such as the General Lifestyle Survey or Health Survey for England.
2. **Drinking patterns** – This hypothesis states that the alcohol harm paradox is genuine and may be explained by differences in patterns of alcohol

consumption, rather than indicators of overall consumption such as the number of units consumed per week. For example, people in lower SES groups may potentially consume similar weekly quantities of alcohol to those in higher SES groups, but be more likely to drink these over fewer days. It is this difference in patterns of consumption that could account for differences in alcohol-related morbidity or mortality risk.

3. **Compounding** - This hypothesis states that the alcohol harm paradox is genuine and may be explained by residents of less deprived populations having greater social and health resilience to disease and social harm through, for example, differences in wellbeing, diet quality, or opportunities for physical activity.
4. **Health services** - This hypothesis states that the alcohol harm paradox is genuine and may be explained by the availability and quality of neighbourhood resources such as health service response to harm, or the quality of treatment provision. For example, residents of deprived areas may not get the same access to, or receive the same quality of health services as more affluent areas.
5. **Poverty gradient** - This hypothesis states that the alcohol harm paradox is genuine and may be explained by heavy drinkers moving into poverty through not being able to work or hold down a job as a result of their alcohol consumption and/or alcohol-related illness. That is, hypothetically, heavy drinkers who manage to stay healthy do not move into poverty, but heavy drinkers who become ill in relation to their alcohol consumption do.

We sought to test some of these hypotheses through a series of interlinked research exercises.

1. Literature reviews (Hypotheses 2 and 3)

Firstly, we undertook a series of systematic reviews of evidence examining the associations between socioeconomic factors and alcohol-related harm (Work Stream 1 of the main report). Systematic reviews attempt to identify, appraise and synthesise all high quality evidence that meets pre-specified eligibility criteria to answer a given research question. Explicit methods aimed at minimising bias are used, in order to produce more reliable findings that can be used to inform decision-making. This type of approach differs from more frequently conducted narrative reviews, which rely on researcher opinion and interpretation to gather evidence and synthesise findings.

Review questions sought to examine the association between SES and i) alcohol related disease; ii) alcohol related mortality and morbidity; and to review evidence that would support the development of Alcohol Attributable Fractions (AAF)ⁱ for specific drinking patterns and SES. Unfortunately, we were unable to identify sufficient evidence to support calculation of AAF, although in the full report we make a number of recommendations in order to respond to this research gap.

With respect to alcohol related disease, we identified differing relationships between a range of alcohol-attributable conditions and socioeconomic indicators. A key consideration of the review was the small number of published studies available that had explored the interaction between alcohol-attributable disease, socioeconomic status, and alcohol use. However, it was possible to conclude that low, relative to high socioeconomic status, was associated with an increased risk of head and neck cancers, strokes, hypertension, and in individual studies, with liver disease and preterm birth. Conversely, risk of female breast cancer tended to be associated with higher socioeconomic status. These findings remained after controlling for a number of known risk factors for these diseases, and other potential confounding factors. In studies that controlled for alcohol use, addition to the statistical models explained a substantial proportion of the difference in risk between high and low SES groups for stroke risk, preterm birth, and in combination with smoking, head and neck cancer risk. This suggested that for these conditions at least, alcohol use was an important contributory factor in the association between SES and disease.

In our second review we examined the association between alcohol related deaths and hospital admissions. There was sufficient evidence available to conduct a meta-analysis, which is a technique to statistically combine the findings of different independent studies. This method provides greater confidence in a particular finding than simply qualitatively comparing data across different individual studies. We found that after combining study data, when SES was determined on the basis of occupation or education (there was insufficient data available on income), individuals of lower SES were almost twice as likely to experience alcohol related death or hospitalisation. Examining men and women separately, compared to those of higher SES class, men in lower SES classifications were also almost twice as likely to experience alcohol-related death or hospitalisation than women.

ⁱ Alcohol attributable fractions refer to the proportion of a disease or injury that could be prevented if exposure to alcohol was eliminated

2. Secondary analysis of existing data (hypothesis 2)

In the second phase of the research we reviewed a number of existing general population surveys for the inclusion of high quality data on SES, area of residence (postcode or lower super output area), and alcohol consumption (Work Stream 2 in the main report). On the basis of this review we selected the General Lifestyle Survey (GLF) for reanalysis, and we used data collected between 2008 and 2010. The GLF is a Government sponsored household survey that provides information on a number of topics including health, diet, employment, education, and substance use (tobacco and alcohol). Although the GLF underestimates self-reported alcohol use⁵, it still provides useful data on a number of alcohol related variables. We used GLF data to explore the relationship between i) drinking behaviours, individual SES, and neighbourhood SES; ii) heavy drinking, individual SES, and neighbourhood SES; iii) beverage preference, individual SES and neighbourhood SES; and iv) drinking behaviour, self-rated health, health service use, and neighbourhood deprivation. We had intended to link GLF data to other data sets providing information on mortality and morbidity, but unfortunately, restrictions applied to the secure GLF analysis platform by the data provider prevented this.

Overall, when analysing all survey respondents, lower neighbourhood SES (measured using IMD) did not appear to be associated with weekly alcohol consumption frequency and level of risk in men, but women residing in neighbourhoods of lower SES were more likely to be classed as lower risk drinkers (i.e. men who drink ≤ 21 units, and women ≤ 14 per week), and less likely to be frequent drinkers (e.g. drinking on 5 days a week). However, once individual level SES (i.e. education, occupation, income, employment status, housing tenure) was controlled for, this relationship no longer remained, suggesting that neighbourhood factors were important, but only for some types of women. Examining individual level SES in particular, lower incomes and education were associated with fewer alcohol drinking days in both men and women.

In contrast to the findings for weekly alcohol use, individual level SES was associated with an increased risk of binge drinking (defined as males who consume > 8 units, and females who consume > 6 units on at least one day a week), and this was more likely to occur in those who reported lower levels of education (not having a degree or diploma in both men and women), and who were either social (men and women) or private renters (women only), compared to house owners. Furthermore, living in the most deprived neighbourhood was associated with an increased likelihood of being a regular 'binge drinker' in both men and women, and this finding was independent of individual SES level factors.

The next stage of the analysis looked at patterns of heavy drinking only. Individual level SES was associated with the highest levels of heavy weekly alcohol consumption (>75 units in men; > 50 units in women). Our analysis suggested that this was related to level of education, rather than social class, income, or housing tenure. Regarding neighbourhood level deprivation, although we initially identified an association between the highest level of deprivation and the heaviest use of alcohol in men, this was not independent of individual level SES.

Moving beyond drinking patterns we then looked at the relationship between beverage choice and deprivation. This was undertaken because previous studies have suggested that the risk of adverse drinking outcomes such as liver cirrhosis might be associated with use of particular types of drink (e.g. spirits). In men, beer or cider was the preferred drink, whilst in women it was wine. Men and women with a preferred drink type of normal strength beer or cider were significantly more likely to report low individual SES, or reside in a deprived area. Men and women who preferred wine tended to be less deprived. The likelihood of being a regular binge drinker was significantly higher among participants with a primary drink type of normal beer or cider compared with wine drinkers. This association was consistent across different age groups, i.e. bingeing on beer or cider was not exclusively a youthful practice. In contrast, wine drinkers were much more likely to exceed recommended weekly unit intake guidelines than beer and cider drinkers. Finally, we only found an association between drinking spirits and bingeing in 45-54 year old men; younger female spirit drinkers were much less likely to report bingeing compared to drinkers of other types of beverage.

In the final analysis in this section we examined the association between neighbourhood level deprivation, self-rated health, recent health service use and relationships with alcohol use. We failed to identify any consistent patterns in the data that were independent of individual level factors such as marital status, or individual SES indicators. However, amongst lower risk drinkers, we did find a robust association between increased neighbourhood deprivation and poorer self-reported health in men. Unfortunately the data could not tell us whether these men had always been lower risk drinkers, or whether ill health (related to alcohol consumption) had led to a reduction in alcohol use. In women, female alcohol abstainers who were living in the most deprived quintile were the most likely to self-report bad or very bad health after controlling for other variables.

3. Improving the accuracy of national alcohol estimates (hypotheses 1 and 2)

Existing methods of collecting self-reported data on alcohol use are known to produce underestimates, and this is one of the reasons why the volume of national

taxed alcohol sales do not match estimates derived from self-reported surveys⁶. Researchers have attempted to address this problem either by using different types of survey question to ascertain alcohol use, or by applying multiplying factors to revise estimates on the basis of factors such as population type, drinking risk, or preferred beverage (e.g. ^{5, 7, 8}). Obtaining more accurate estimates of alcohol use is important because it allows for more precise modelling of the relationship between alcohol and a range of different outcomes, and has useful policy and intervention utility. For the purposes of the current study, examining underreporting was important because the alcohol harm paradox may be a result of differential underreporting biases on the basis of SES or alcohol drinking risk; i.e. i) lower SES respondents underreport use to a greater extent than less deprived respondents and the relationship between SES is due to this; and ii) underreporting might be greatest in higher risk categories, and these individuals are more likely to be more deprived.

We therefore developed a new survey that in addition to including quantity and frequency questions common to household surveys such as the GLF (which we termed our 'typical estimate' of alcohol use), also included questions about special occasions such as birthdays or the Xmas period, and occasions where the respondent might have drunk more or less than usual (which we termed our 'combined estimate'). By comparing estimates of typical and combined estimates we were able to determine whether underreporting was related to SES and other factors (Work Stream 3 in the main report). The survey was administered via telephone using a stratified random sampling design, and we obtained usable data from 6833 individuals. After cleaning, data was weighted to ensure it was representative of the English general population.

We additionally surveyed two populations that are underrepresented in surveys of alcohol use; University students and clients of hostels. These were included to better understand the contribution that such group make to population level estimates (per capita) of alcohol consumption. These two surveys were conducted face to face and used a convenience sample and so were not considered representative of the wider population.

Across the whole telephone survey sample, the combined estimate of drinking captured an additional 25.1% more alcohol units than the traditional typical estimate. This also led to a higher proportion of the population being classified in increasing (16.6% → 21.7% for men; 13.3% → 18.7% for women) and higher risk (5.9% → 8.9%; 2.6% → 4.9%) drinking categories, with a corresponding decrease in the proportion of lower risk drinkers (77.5% → 69.4%; 84.1% → 76.3%). Women typically underestimated drinking to a greater extent across all three drinking risk categories. Initial analysis suggested that residents of more deprived IMD quintiles were more

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likely to report both last year drinking, and more frequent drinking, but once other important factors such as individual level SES and sociodemographic indicators were taken into account differences between typical and combined estimates of alcohol use were unrelated to neighbourhood level deprivation. However, there were significant differences in underreporting of use on the basis of drinking risk, with those classed as being at higher risk underreporting to a greater extent than lower and increasing risk groups.

We investigated whether there was an association between the combined alcohol use estimate and neighbourhood- and individual level deprivation on self-rated health, outpatient or casualty use in the previous 12 months, and in-patient hospital stays in the previous 12 month. Level of alcohol risk, but not deprivation, was associated with poorer self-rated health, and increased likelihood of attending casualty or an in-patient hospital stay. These findings were independent from a number of important individual level sociodemographic indicators and determinants of health such as diet, exercise, and smoking status.

The data collected from two populations underrepresented in national estimates (University students and hostel service users) indicated higher weekly alcohol unit consumption compared to the telephone survey. Compared with the telephone survey estimate (independent of age), the hostel sample reported consuming 97.1% (males) and 222.1% (females) more units per week. Irrespective of age, the combined weekly estimate for students was 7.0% (men) and 20.0% (women) higher than the telephone survey estimate. Comparing 18-21 year olds only (the modal age range of UK university students), we estimated an increase in weekly units of 37.8% in men but a decrease of -20.3% in women.

In summary, it was possible to conclude from this Work Stream that the alcohol harm paradox is not a result of differential under-reporting between different SES groups, that underreporting is not a result of the interaction between drinking patterns and deprivation, and that heavier drinkers, regardless of level of deprivation, are more likely to underestimate consumption.

Summary and Conclusions

We originally developed five research hypotheses that might help explain the alcohol harm paradox; although in the current work we only directly tested hypotheses 1 to 3:

1. **Under-reporting** or inaccurate reporting in low SES groups, or by heavy drinkers in low SES groups, compared to less deprived groups;

2. Differences in **drinking patterns** between SES groups rather than differences in intake (e.g. 'bingeing' and heavy episodic use; drink-type preference)
3. **Compounding** due to clustering of unhealthy behaviours and associated risk factors in more deprived neighbourhoods.
4. Differential access to, and quality of, **health services** and other neighbourhood resources such as alcohol outlets.
5. The **poverty gradient** through which unhealthy heavy drinkers moving into poverty through loss of employment opportunities.

The findings of our work may be summarised as follows:

- There is good evidence that people in low SES show a greater susceptibility to the harmful effects of alcohol, but a lack of published evidence means that it is not possible to conclude what mechanisms and pathways might underlie this difference in risk.
- Analysis of existing household survey data suggested that SES groups do not differ in the amount and frequency of alcohol drunk across the week, but that there are important differences in frequency of 'binge drinking', beverage choice, and patterns of heavy drinking. This association remains after controlling for a number of important confounding factors.
- Analysis of existing household survey data does not suggest a link between SES and self-reported health related outcomes of alcohol use, once the influence of important confounding factors have been controlled for. It remains unknown whether after controlling for such factors, associations between deprivation, patterns of alcohol use and health outcome data collected by formal monitoring systems such as hospital will remain.
- The results of a new telephone survey that was representative of the English adult population, showed that although there is underreporting in general population alcohol surveys, this does not seem to differ by SES.
- There is differential underreporting, however, on the basis of alcohol risk, with higher risk drinkers underreporting to a greater extent than lower risk drinkers. This effect is independent of neighbourhood and individual level SES, and other important confounding factors.
- Our telephone survey suggested that use of adjusted estimates of general population alcohol use is likely to lead to more people being classified at increasing and higher risk from their alcohol use. This has important implications for policy and health service planning and provision.
- Our telephone survey did not support a link between SES and self-reported health related outcomes of alcohol use after controlling for important confounding factors such as diet, smoking, and exercise. However, alcohol risk

classification was important in this regard. It still remains to be established whether after using revised consumption estimates there are associations between deprivation and patterns of alcohol use with health outcome data collected by formal monitoring systems such as hospitals.

- It is possible to more accurately estimate alcohol use in underrepresented groups such as those at risk from homelessness, and University students. Including groups such as hostel users in per capita estimates of alcohol use will increase total alcohol yield to a small degree (as this is a relatively small population size), but as suggested from our booster survey with students there may be important demographic differences in the sign and size of estimates for other key groups.

Overall, this programme of work supported the hypothesis that the alcohol harm reduction paradox is genuine and is not a result of methodological biases. Precise mechanisms remain to be determined, although the research identified useful further avenues of investigation. Although our systematic reviews showed there is good evidence to conclude low individual and neighbourhood SES (relative to less deprived SES) is related to a range of alcohol related health outcomes and alcohol related mortality, a lack of published data means that the precise interaction between patterns of alcohol use, SES, and health outcomes remains uncertain. Analysis of high quality survey data (for England and Great Britain as a whole) suggested that there are differences between SES groups in patterns of alcohol use, but these are unrelated to self-reported health quality and use of health services. It is therefore important to conduct further data linkage activities to examine the relationship between patterns of alcohol use reported in surveys with records held in individual and neighbourhood data sets, such as Hospital Episode Statistics, NHS Health Check Data, and neighbourhood level alcohol profiles (e.g. local alcohol profiles for England; LAPE).

This work supports the use of policies such as alcohol Minimum Unit Pricing, which target hazardous and harmful drinkers in lower socio economic groups without financially penalising moderate drinkers. Whilst public health licensing objectives have been introduced in Scotland, work is still underway to ensure local data systems are able to respond to licensing applications and monitoring of existing licences in a useful manner. It is recommended that once evidence systems are sufficiently robust health objectives are included in licensing decisions in the rest of the UK.

1 INTRODUCTION

1.1 Clarification of the purpose of the study

Researchers and public health professionals have long been concerned about the apparent relationship between health and socioeconomic status (SES). SES refers to the position of individuals or groups in society based on a range of social and economic factors that influence this position.⁹ Research has also explored whether the characteristics of neighbourhoods and area of residence has an effect on health and health behaviours such as alcohol consumption independent from individual SES. Studies show a clear and persistent gradient in the risks of alcohol-related mortality and morbidity by SES such that those with low SES are much more likely to die or suffer from a disease related to their alcohol use.¹⁰⁻¹² In the English population, this includes higher rates of specific mental and behavioural conditions related to alcohol use, and alcohol-attributable acute and chronic conditions.¹³ Out of all causes of liver disease, alcohol-related disease is particularly strongly related to the socioeconomic gradient.¹⁴ However, published studies and population surveys show that the relationship between SES and drinking patterns is not straightforward.¹⁵⁻²⁴

The aims of the Alcohol Harm Paradox study were to better understand the disproportionate impact that alcohol consumption has on poorer communities. These findings could be used to inform intervention and policy development to reduce alcohol-related health inequalities.

1.2 Background

Studies of alcohol-related mortality in England and Wales have shown that there are clear associations between alcohol-related mortality and socioeconomic deprivation.^{25, 26} Based on deaths between 1999 and 2003, males and females in the most socioeconomically deprived quintiles were respectively, three and two times as likely to die from an alcohol-related condition than males and females in the least deprived quintiles.²⁵ Analysis of data from the North West of England shows that there is little difference in consumption between males in the most deprived areas and those in the least deprived areas (measured by Index of Multiple Deprivation [IMD] deciles; 14.9 units in most deprived vs. 15.3 units in least deprived), and that for women, consumption is higher among those living in the least deprived areas (5.9 units in most deprived vs. 8.4 units in least deprived).²⁷ However, further analysis of data for the whole of England shows that rates for alcohol-related

admissions to hospitals are much higher among both males and females from the most deprived areas than those from less deprived areas (Figure 1). For example, admission rates for alcohol-specific mental and behavioural conditions of 717.5 per 100,000 (95% CI: 706.5 to 728.4) among males in the most deprived areas compared to 95.1 per 100,000 (95% CI: 91.2 to 98.9) among males in the least deprived areas (measured by IMD deciles).

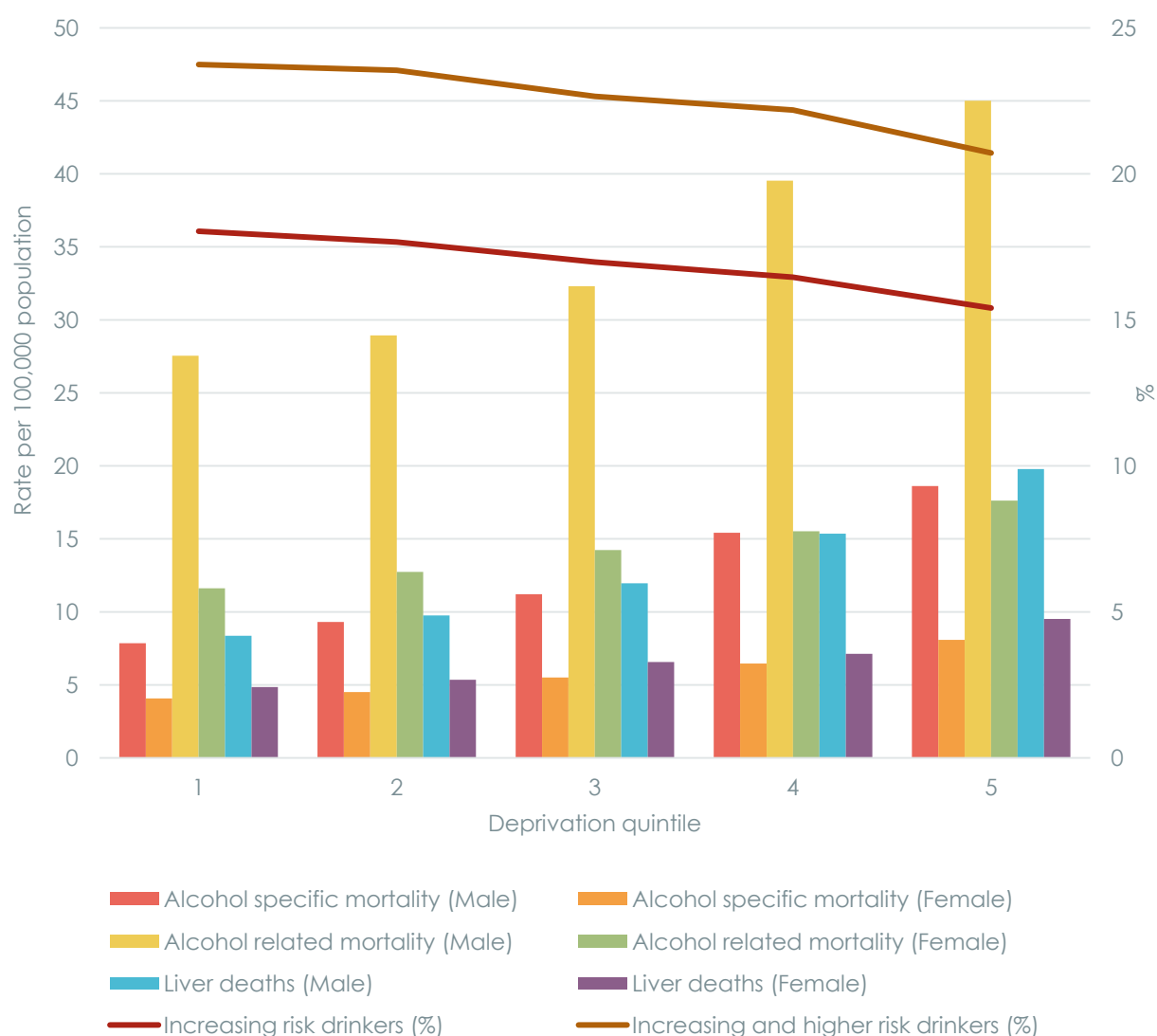


Figure 1.1. Variations in alcohol-related mortality and drinking patterns with deprivation (Local Alcohol Profiles for England, Centre for Public Health, 2012)

Differences between socioeconomic status (SES) and alcohol-related mortality and hospital admissions have also been reported in Finland, Sweden and other European countries,^{10, 12, 15} and, as in England, surveys of drinking behaviour have provided little explanation for the differential risk in harms.

1.3 Research hypotheses

The approaches of the analyses used in this study were developed based on the following set of hypotheses, designed to explore why deprived populations that apparently consume the same or less alcohol than more affluent populations suffer far greater levels of harm (the 'alcohol harm paradox'):

6. **Under reporting** - The alcohol harm paradox is not genuine and is an oversimplification or a result of inaccurate recording of consumption data. Potentially, under reporting may be more likely among people from low socioeconomic groups because: (a) there may be lower accuracy in reporting consumption; (b) heavy drinkers of low SES may not contribute to surveys; or (c) heavier drinkers are more likely to be both of lower SES and underestimate their consumption.
7. **Drinking patterns** - The alcohol harm paradox is genuine and may be explained by differences in patterns of alcohol consumption, rather than overall consumption. For example, people in lower SES groups may potentially consume similar weekly quantities of alcohol to those in higher groups, but more commonly over fewer days, and that this could account for differences in morbidity or mortality risk.
8. **Compounding** - The alcohol harm paradox is genuine and may be explained by affluent populations having greater social and health resilience to disease and social harm through, for example, differences in wellbeing, diet quality, or opportunities for physical activity.
9. **Health services** - The alcohol harm paradox is genuine and may be explained by the health service response to harm, or the quality of treatment provision, in different areas; for example, deprived areas may not get the same access to, or receive the same quality of, health services as more affluent areas.
10. **Poverty gradient** - The alcohol harm paradox is genuine and may be explained by heavy drinkers being pushed into poverty through not being able to work or not holding down a job as a result of their alcohol consumption and/or alcohol-related illness. That is, hypothetically, heavy drinkers who manage to stay healthy do not move into poverty, but heavy drinkers who become ill in relation to their alcohol consumption do.

1.3.1 Under reporting of alcohol consumption

UK population surveys typically estimate average weekly consumption using the quantity-frequency method based on respondent estimates of how often they drank different drink types over the last year and how much they usually drank on any one day.²⁸ It is widely acknowledged that national surveys underestimate population levels of alcohol consumption, as shown in the discrepancies between estimates drawn from UK survey data and those from taxation figures on alcohol sales. Based on the 2010 General Lifestyle Survey, weekly consumption was estimated to be 11.5 units per adult aged over 16 years in Great Britain; approximating to the consumption of around 6 litres of pure alcohol per adult. In comparison, taxation (i.e. clearance) data for 2010/11 showed that per adult (aged 16 years and over), the equivalent of 10.6 litres of pure alcohol were taxed; equating to *per capita* consumption estimates of around 20 units per adult per week. The difference between the General Lifestyle Survey and taxation data amounts to around 430 million units per week, meaning that around one bottle of wine per adult drinker per week is unaccounted for in the national survey data. Comparison of taxation figures on alcohol sales, the General Lifestyle Survey (formerly the General Household Survey) and Scottish Health Survey over time suggest that differences in *per capita* consumption and survey estimates of alcohol intake have increased since 2000;²⁹ this is despite revisions to the methodology used to produce consumption estimates in 2006. Additional sources of unrecorded alcohol consumption arise from cross border trade, illicit alcohol sales, and home brewing of alcohol.

Different factors have been suggested to account for the differences that arise between alcohol sales figures and survey data,^{5, 28} including spillage and wastage, alcohol use in food, consumption by children and young people, tourism, and other problems with the design of surveys such as missing populations and problems with recalling alcohol consumption.²⁸ Drinkers may neglect to report occasional (even routine) heavy drinking sessions, may underestimate drink sizes and their alcohol content, and may not report changes in their consumption during holidays at home or abroad, special occasions (e.g. weddings, birthdays) or celebratory times of year (e.g. Christmas). Certain populations and types of heavy drinkers are also underrepresented or missing in surveys either through choice or through circumstances that exclude them from typical sampling frames. Such groups include homeless populations, students, military personnel, prisoners, and dependent drinkers.^{5, 28} Whether the exclusion of such populations from surveys

masks differences in consumption between deprived and more affluent populations requires further study.

1.3.2 Drinking patterns

Both average consumption and episodic drinking occasions make an important contribution to alcohol-related harm, with heavy drinking occasions particularly contributing to injury and other acute health problems. The now widely adopted definition of 'binge drinking' is of an intake of large volumes of alcohol on a single occasion, but differences in operational definitions remain.³⁰ Differences in drinking patterns matter such that heavy or binge drinking on one occasion every month has different risks for the development of chronic diseases (such as liver cirrhosis) compared with heavy or binge drinking almost every day.³¹ In relation to alcohol-related disease development, a recent meta-analysis found that any cardioprotective effects of moderate alcohol consumption were cancelled out by irregular heavy drinking occasions (≥ 7.5 units per occasion at least monthly) mixed with an average frequency of low to moderate consumption.³² In relation to alcohol-related injury, while all groups of drinkers (regardless of frequency and intake) are at increased risk, research suggests that those drinkers who on occasion drink heavily are at higher risk of alcohol-related injury than chronic heavy drinkers.³³ While information is not available at a national level on alcohol-related injury, as a proxy the Violence Indicator Profiles for England Resource (VIPER) A&E indicator shows a strong and steep relationship between deprivation and presentations to A&E for assault, a high percentage of which are likely to be alcohol-related (Figure 2).³⁴ Therefore, whether differences in patterns of alcohol consumption between deprived and more affluent populations helps to explain the harm paradox, in a way that overall consumption has not, warrants consideration.

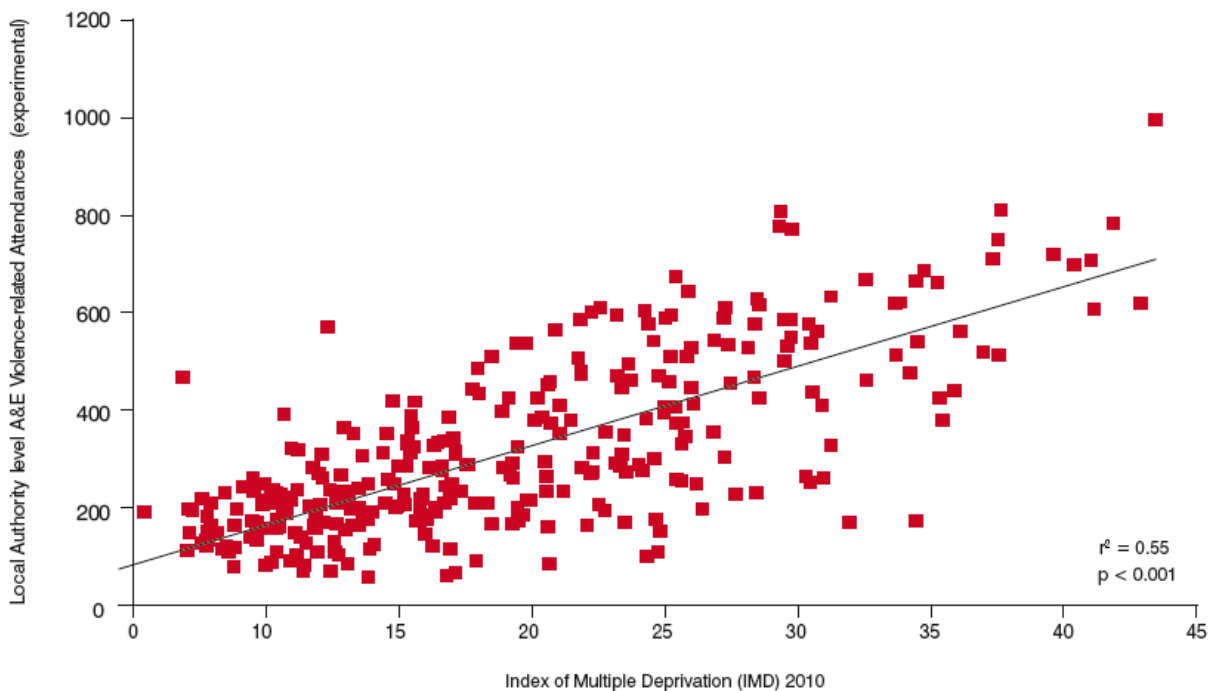


Figure 1.2. Correlation of the Index of Multiple Deprivation 2010 and estimated violence-related A&E first attendance rates per 100,000 resident population by English local authority - 2010/11 financial year (experimental)

North West Public Health Observatory, 2012³⁴

1.3.3 Compounding

The interactions between alcohol and other health harms and lifestyle behaviours are another factor that may play a role in the differences in alcohol-related harm between deprived and more affluent populations. Evidence shows that the health effects of alcohol consumption combined with other lifestyle risk factors such as smoking, poor diet and physical inactivity may be multiplicative. For example, a large prospective study of Scottish men shows that combined heavy alcohol use combined with a high BMI elevates liver disease risk,³⁵ and that heavy drinking and smoking combined increases the overall risk of death.³⁶ While studies have found evidence for a social gradient in the co-occurrence of lifestyle risk factors,³⁷⁻⁴⁰ few studies have examined clustering of lifestyle risk factors stratified by alcohol consumption. For the combination of smoking and heavy alcohol use, the large study of Scottish men referred to above found evidence for social patterning of these behaviours in that population.³⁶

Also of relevance to our hypothesis of compounding is that both the context and composition of neighbourhoods play a role in determining the health of individuals.⁴¹ Living in a deprived neighbourhood is thought to impact more negatively on the health of poorer individuals,⁴² giving rise to the 'double jeopardy'

hypothesis. In relation to drinking behaviours, studies have found both null effects,⁴³ and evidence in support of this theory.²³

1.3.4 Poverty gradient

Harmful use of alcohol may have socioeconomic consequences for individuals, including loss of earnings, unemployment, family disruption or stigmatization.⁴⁴ People of low SES to start with may therefore suffer further disadvantage as a result of their harmful use of alcohol, and among people of higher SES the socioeconomic consequences may give rise to or intensify downwards social mobility.⁴⁵ The resulting socioeconomic consequences from alcohol-related harm may mean that from one perspective, individuals suffering from alcohol-related harm cannot afford to be ill, and from another that they cannot get better. Differences in social and financial support, from a partner, employers or others in an individual's social network, has been suggested as a potentially important explanation for differential risks between people of lower and higher SES.⁴⁶

2 WORK STREAM 1: WORKING WITH CURRENTLY AVAILABLE LITERATURE

2.1 Overview

Using systematic review methodology we identified published studies that examined the association between socioeconomic factors and alcohol-related harm. The objective of this work stream was to explore whether the association between alcohol consumption and the risk of alcohol-related harms differed according to socioeconomic factors. We also planned to explore how drinking patterns modified the effect of socioeconomic factors on harm.

Depending on the strength of evidence supporting an association between low SES and each condition, we proposed to generate SES-specific Alcohol Attributable Fractions (AAFs) using, where feasible, new methodology for calculating AAFs. Our exploration of whether the derivation of AAFs related to drinking pattern and SES was feasible identified that insufficient data were generated. We instead present a commentary on the data requirements and developments needed to generate SES specific AAFs in future work in Section 2.4.

2.2 Methodology

2.2.1 Alcohol-attributable disease

Searches were undertaken in Medline, Embase, PsycINFO, CINAHL, and Web of Science in November 2012. A search strategy was developed using a combination of free text and controlled vocabulary terms and adapted for each database. References were additionally identified through searches of reference lists.

Titles and abstracts identified through the searches were reviewed independently by two reviewers. At this stage we sought to identify studies of any alcohol-attributable condition that reported outcomes according to differing levels of SES (any measure of SES was accepted at this stage). Studies identified as potentially relevant by either reviewer were retrieved for further inspection. Full text copies of the selected studies were retrieved and independently reviewed against the full inclusion criteria by two reviewers from a team of three. Studies were retained if they met the following criteria: (i) case-control or cohort study; (ii) participants were aged 16 years or older; (iii) reported definitions and measurement of SES (including income, occupation, level of education or aggregate measures of neighbourhood-level deprivation); (iv) reported risk, odds or hazard ratios (RR) across different exposure categories of alcohol consumption; (v) reported mortality or morbidity outcomes for chronic conditions with a known adverse risk relationship with alcohol

consumption (liver disease, hypertension, cancers of the head and neck, female breast cancer, oesophageal cancer [squamous cell carcinoma], colorectal cancer, liver cancer, stroke, diabetes, epilepsy, cardiac arrhythmia, pancreatitis, preterm birth); (vi) published in the English language.

Methodological details recorded from studies included study details; participant details; response rates (at baseline/ follow-up); follow-up duration; SES measures; and alcohol consumption measures. In addition, where reported, we extracted (adjusted and unadjusted) RRs and corresponding precision for each alcohol exposure category, stratified by SES. Where such data were not available we extracted (adjusted and unadjusted) RRs and corresponding precision for each alcohol exposure category and each SES category independently retaining the RR comparing the lowest and highest SES categories. Quality was assessed using the Newcastle-Ottawa Scale. Data extraction and quality assessment were undertaken by one reviewer from a team of two and checked for accuracy by a second reviewer from a team of three.

Our planned methods included meta-analysis to generate pooled estimates (RR and 95%CI) of the change in risk of alcohol consumption among participants with differing SES. In practice, we identified very few studies that reported alcohol exposure categories stratified by SES and therefore used a narrative approach to synthesise the findings of the included studies. As a first step, each of the studies identified for inclusion was classified according to whether an increased risk of disease was reported to be associated with each measure of socioeconomic status examined in unadjusted models. We then further examined the effect of SES on disease risk outcomes in studies that attempted to control for alcohol consumption, either alone or in combination with other behavioural risk factors. For studies where models were adjusted for alcohol use alone we calculated the percentage change in odds ratio between the highest and lowest SES category brought about by the addition of alcohol use to the unadjusted model. As a third step, we explored the interaction between alcohol use and SES.

2.2.2 Alcohol-related morbidity and mortality

A number of references were identified in the review of alcohol-attributable disease that examined morbidity and mortality from alcohol-related conditions. These studies did not report risk across different exposure categories of alcohol consumption so were excluded from the review of alcohol-attributable disease. A separate set of inclusion criteria were therefore developed and additional searches

of the literature conducted to examine the association between SES and alcohol-related mortality and morbidity.

As noted, references were initially identified for inclusion from the broader searches undertaken for the review of alcohol-attributable diseases in November 2012 and secondary searching undertaken in May 2013. The secondary search was designed to more specifically identify studies that examined deaths and hospitalisation from conditions directly attributable to alcohol consumption (i.e. conditions for which the International Classification of Disease code description or equivalent included the word 'alcohol'). References were additionally identified through searches of reference lists. Studies were retained if they met the following criteria: (i) prospective register-based cohort or registry-based follow-up studies; (ii) participants were aged 16 years or older; (iii) reported definitions and measurement of SES (including income, social class based on occupation, level of education or aggregate measures of neighbourhood-level deprivation); (iv) reported risk or hazard ratios (RR); (v) reported mortality or morbidity outcomes for conditions directly attributable to alcohol consumption (defined by the study authors but including for example, liver cirrhosis, alcohol intoxication, alcoholic gastritis, alcohol-induced pancreatitis); (vi) published in the English language.

Methodological details recorded from the studies included study details; participant details; response rates (at baseline/ follow-up); follow-up duration; and SES measures. In addition, where reported, we extracted (adjusted and unadjusted) RRs and corresponding precision for each SES category. Quality was assessed using the Newcastle-Ottawa Scale for cohort studies. Adjusted (or unadjusted) RRs and their corresponding 95% confidence intervals (CI) were tabulated, retaining the comparison between the lowest and highest SES category for each SES measure reported. Where sufficient studies were available we used meta-analysis to generate pooled estimates (RR and 95% CI) of the risk of alcohol-related death or hospitalisation for the lowest compared to the highest SES category. Heterogeneity was explored using standard statistical methods (Cochran Q and I^2 tests). Meta-analysis was undertaken in the StatsDirect software package using the Summary meta-analysis function.

2.3 Summary of findings

2.3.1 Alcohol-attributable disease

The included studies covered a range of alcohol-attributable conditions that demonstrated differing relationships with socioeconomic inequality. Low relative to high SES was associated with an increased risk of head and neck cancers, strokes,

hypertension, and in individual studies with liver disease and preterm birth. Conversely, risk of breast cancer tended to be associated with higher SES. These findings also held in models adjusted for known risk factors and other potential confounding factors. A key finding of our review was the lack of studies that have explored the interaction between alcohol-attributable disease, socioeconomic status and alcohol use. In studies that adjusted for alcohol use independently, its addition to the models explained a substantial proportion of the difference in risk between high and low SES groups for stroke risk, preterm birth, and in combination with smoking, head and neck cancer risk. Two studies, of breast cancer and oesophageal cancer risk respectively, showed that when SES measures were stratified by alcohol use, risks were greatest among low SES groups. Whilst acknowledging the scarcity of the evidence available, we propose that the findings of the review may provide further evidence that people of low SES show a greater susceptibility to the damaging effects of alcohol.⁴⁶ However, the mechanisms and pathways underlying this differential risk remain unclear and require further study.

2.3.2 Alcohol-related mortality and morbidity

Findings from the systematic review and meta-analysis of alcohol-related mortality and morbidity confirm those from individual studies that men and women of low SES have a higher risk of death or hospitalisation from alcohol-related causes than those of high SES. However, our findings also show that there was much uncertainty around the pooled estimates generated indicating that variation exists in the risk of alcohol-related mortality and morbidity between studies. The included studies were conducted in a narrow range of Northern European countries, and risk estimates were therefore missing for most countries and across different types of drinking cultures. However, ecological studies conducted in Australia and Chile have also found that alcohol-attributable mortality is associated with socioeconomic disadvantage,^{47, 48} providing further evidence in support of the patterns of association shown in the pooled estimates.

2.4 SES specific alcohol-attributable fractions

By quantifying the difference in risk of developing alcohol-attributable conditions according to SES, we had proposed to develop SES specific alcohol-attributable fractions. As this was not possible given the scarcity of the evidence. Here we discuss the data requirements and developments needed to generate SES specific alcohol-attributable fractions through future work.

Calculation of alcohol-attributable fractions requires the combination of condition-specific relative riskⁱⁱ and estimated drinking prevalence in the population of interest. Through the systematic review approach described above we had proposed to derive SES-specific relative risks through meta-analysis for each of the alcohol-attributable conditions and combined these with estimates of drinking prevalence in low relative to high SES populations. Other approaches to developing alcohol-attributable fractions specific to particular populations of interest that we identified have focused on using drinking prevalence.⁴⁹ This was not considered a feasible approach for deriving SES-specific fractions as drinking prevalence estimates used in the calculation of the fractions are based on weekly alcohol consumption,⁵⁰ which would likely underestimate alcohol-attributable deaths in low SES populations.

To derive SES-specific relative risks for alcohol-attributable conditions, systematic data on how the impact of proximate risk factors differs by socioeconomic groups is required. Our systematic approach was limited to analysis of published summary data and we were unable to find studies with the required level of data on how risk of alcohol consumption differed between socioeconomic groups for the conditions examined. Individual patient data (IPD) meta-analysis is an approach that by being based on original 'raw' research data could potentially address the limitations of the published data identified.⁵¹ However, IPD meta-analyses are large collaborative projects and are more time consuming and costly than traditional approaches to meta-analysis.

ⁱⁱ Defined as the rate (risk) of the outcome of interest in one group (e.g. most deprived) divided by the rate of the outcomes in another (e.g. least deprived).

3 WORK STREAM 2: EPIDEMIOLOGICAL DATA REVIEW

3.1 Methodology

3.1.1 Review of existing datasets

To determine the extent to which alcohol consumption, harm and deprivation were linked to other indicators of health and wellbeing we planned to use existing datasets to develop a model linking individual-level survey data with area-level variables. National data sources that recorded individual-level information on: i) alcohol consumption; ii) markers of SES (e.g. income); and iii) provided information on postcode or lower super output area of residence (LSOA) were selected through a review of the various population surveys that record alcohol consumption. Using structured data collection forms information was recorded from each survey to generate a description of each dataset. Each dataset identified was reviewed and checked against the original research questions and hypotheses formulated for the project.

3.1.2 Analysis of existing data

Based on the review of datasets, we identified that the General Lifestyle Survey provided the best source of individual-level variables on alcohol consumption, socioeconomic factors and other variables of interest. The dataset is held by the UK Data Service and we were able to apply for access to the secure version of the dataset which provided postcode information for respondents. This enabled us to link the General Lifestyle Survey dataset with area-level (neighbourhood) deprivation via postcode and LSOA to investigate the relationships between quantity and patterns of alcohol consumption and socioeconomic factors.

Three consecutive years (2008 to 2010) of the General Lifestyle Survey were used to explore primarily whether particular socioeconomic factors and attributes related to volume, quantity, and frequency of alcohol consumption were associated with neighbourhood deprivation. We also examined whether relationships existed between socioeconomic factors and alcohol consumption and other health and wellbeing variables. The limitations of the secure access environment, however, meant that we were not able to link the dataset to area-level mortality and morbidity outcomes and therefore it was not feasible to carry out the full set of additional analyses outlined in the project proposal.

3.1.3 Secondary analysis of the General Lifestyle Survey

We restricted our sample to adults aged 16 years and older who were living in England at the time of participation in the General Lifestyle Survey. Respondents for whom information on drinking behaviours were unavailable were removed from the dataset leaving a sample of 29,624 adults. Based on their reported drinking behaviours, respondents were categorised according to whether they were lifetime abstainers, former drinkers or current drinkers. Based on their combined estimate of weekly consumption we further categorised current drinkers on the basis of their drinking behaviour as follows:

- (i) lower risk drinkers were men who drank >0 to ≤ 21 units and women who drank >0 to ≤ 14 units;
- (ii) increasing risk drinkers were men who drank >21 to 50 units and women who drank >14 to 35 units; and
- (iii) higher risk drinkers were men who drank >50 units and women who drank >35 units.

Current drinkers were also categorised according to whether in the last week they had drank on 5 or more days of the week and whether they were regular binge drinkers. It was only possible to determine regular binge drinking by examining each drink type individually. Therefore, for each drink type, any occasion of consuming more than double the recommended limits (6 units for women and 8 units for men as used by the NHS in England) on at least one day a week was classified as regular binge drinking. Participants who were regular binge drinkers of at least one of the drink types were categorised as a regular binge drinkerⁱⁱⁱ. We used binomial and multinomial logistic regression to explore relationships between combinations of SES and alcohol consumption categories.

3.2 Summary of findings

3.2.1 Association between drinking behaviours, individual SES and neighbourhood deprivation

Compared to being a lower risk drinker, decreasing individual SES was associated with increased odds of being a lifetime abstainer or a former drinker (Tables 3.1 and 3.2). The association was reversed for increasing risk drinkers, with decreasing SES being associated with lower odds of being in this category compared to being a

ⁱⁱⁱ We acknowledge the limitations of this approach. In particular this approach provided a conservative measure of binge drinking and may have misclassified participants whose pattern of harmful drinking was made up of consumption across more than one drink type.

lower risk drinker (Table 3.3). The majority of the SES measures examined were not associated with being a higher risk drinker, with the exception of household income. Among men and women, decreasing household income was associated with lower odds of being a higher risk drinker independently of the other SES measures (Table 3.4). Based on the categorisation of weekly consumption estimates, we did not find an association between drinking behaviours and increasing neighbourhood deprivation that was independent of individual SES (Table 3.5). Among current drinkers, decreasing SES was significantly associated with lower odds of having drunk on five or more days in the last week (Table 3.6). The association between decreasing SES and drinking days was independent of the other SES measures for level of education and household income. Being in the bottom two quintiles of deprivation was associated with reduced odds of having drunk on five or more days in the last week compared to the top quintile (Table 3.8). This association was independent of individual SES for women but not men. Regular binge drinking showed a reverse pattern of association with SES compared to the other drinking behaviours examined. A decreasing level of education and decreasing social class were associated with increasing odds of being a regular binge drinker (Table 3.7). The association between regular binge drinking and level of education was independent of the other measures of SES examined. Greater odds of being a regular binge drinker were also associated with increasing neighbourhood deprivation (Table 3.8). This effect was independent of individual SES among men in the lowest income quintile.

3.2.2 Association between heavy drinking, individual SES and neighbourhood deprivation

Broken down further by weekly consumption, 22.9% of increasing/higher risk drinkers drank more than 50/35 units a week, and 8.9% drank more than 75/50 units a week. Classification across the three categories differed significantly by sex (p for trend <0.001). Men were more likely than women to have drunk more than 50/35 units a week (16.0% vs. 11.6%), but a slightly higher proportion of women than men drank more than 75/50 units (9.2% vs. 8.5%). There was no difference in classification of risk by age or ethnicity. Classification of risk differed significantly by marital status among men ($p=0.01$) but not women. A higher proportion of men who were single drank more than 75 units a week compared to those who were married, cohabiting or had a partner (10.1% vs. 7.4%).

The odds of having a lower level of education, lower occupational social class, being unemployed, being in the lowest income quintile and living in social rented

accommodation were significantly higher among men and women with weekly consumption greater than 75/50 units compared to heavy consumption between 21 to 75 and 14 to 50 units a week. Women who were classified as the heaviest drinkers also had significantly higher odds of being private renters. In the full model with adjustment for the control variables and individual SES, among men the odds of being in the heaviest drinking and level of education was independent of other SES factors, but the relationship with other SES factors was not. Among women, a significant relationship between decreasing SES and heavy drinking was diminished once other SES variables were adjusted for.

Among heavy drinkers, in the unadjusted model and adjusted for the control variables, men (but not women) in the most deprived quintile had significantly higher odds of being in the heaviest drinking category (>75 units/week). However the relationship was non-significant in the full model indicating that the relationship was not independent of individual SES factors.

3.2.3 Association between preferences for types of alcoholic drinks, individual SES and neighbourhood deprivation

One aspect of drinking behaviour that has not been extensively studied in relation to the differential risk associated with SES is differences in preferences for types of alcoholic drinks. While some epidemiological studies have found an association between spirit consumption and the risk of liver cirrhosis,^{52, 53} whether predominant wine consumption reduces the risk of developing liver cirrhosis has not been confirmed.^{54, 55} However, studies conducted in the US and Sweden have found associations between consumption of strong beers and risk of adverse drinking consequences.^{56, 57} We therefore examined whether there were associations between the drink type that contributed most to estimates of weekly unit consumption and individual SES and neighbourhood deprivation.

Our analyses found that the relationship between individual SES and area-level measures differed according to primary drink type between normal beer or cider, spirits and wine (Jones et al., In Prep[c]).

3.2.4 Association between drinking behaviours, self-rated health, recent health service use and neighbourhood deprivation

A study in the East of England found that independently of individual SES, people living in deprived neighbourhoods were more likely to suffer from poorer health in general.⁵⁸ Other research suggests that resources offered in neighbourhoods, such as access to healthcare or opportunities for engaging in health behaviours, may

differ and contribute to inequalities in health.⁵⁹ We therefore examined the association between neighbourhood deprivation and self-rated health and recent health service use stratified by patterns of drinking behaviour.

Our analyses did not identify a clear relationship between increasing neighbourhood deprivation and three measures of recent health service use (Jones et al., In Prep[d]). There was an association between increasing neighbourhood deprivation and recent consultation with a GP among lower risk drinkers but this was diminished after adjustment for individual SES. However, among men and women who were lower risk drinkers and women who were lifetime abstainers, increasing neighbourhood deprivation was associated with poorer health status, independent of individual SES.

3.3 Tables

Table 3-1 Odds ratios (95% confidence intervals) for individual SES for lifetime abstainers compared to lower risk drinkers.

	Men			Women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Education						
Degree or diploma	1.00	1.00	1.00	1.00	1.00	1.00
A-level or apprenticeship	0.70 (0.50-0.99)*	0.68 (0.47-0.99)*	0.57 (0.39-0.85)**	0.70 (0.50-0.99)*	1.28 (0.97-1.69)	1.07 (0.80-1.43)
GCSE or equivalent	0.99 (0.73-1.35)	0.95 (0.67-1.33)	0.71 (0.48-1.06)	0.99 (0.73-1.35)	1.40 (1.10-1.78)**	1.00 (0.77-1.29)
Other qualification	1.85 (1.24-2.76)**	1.43 (0.89-2.28)	1.05 (0.65-1.68)	1.85 (1.24-2.76)**	3.21 (2.38-4.33)***	2.04 (1.49-2.80)***
No qualification	1.77 (1.31-2.39)***	2.36 (1.70-3.28)***	1.44 (1.00-2.10)	1.77 (1.31-2.39)***	3.75 (2.94-4.78)***	2.06 (1.59-2.68)***
Occupational social class						
Managerial and professional	1.00	1.00	1.00	1.00	1.00	1.00
Intermediate occupation	1.91 (1.39-2.62)***	1.73 (1.23-2.43)**	1.35 (0.93-1.95)	1.35 (1.08-1.69)**	1.39 (1.11-1.74)**	1.09 (0.86-1.40)
Routine and manual occupation	2.09 (1.60-2.72)***	1.85 (1.39-2.47)***	1.28 (0.92-1.78)	2.03 (1.67-2.45)***	1.90 (1.56-2.31)***	1.07 (0.85-1.35)
Never worked and long-term unemployed	5.45 (3.61-8.23)***	3.39 (1.92-6.00)***	2.45 (1.38-4.37)**	12.50 (9.59-16.31)***	8.59 (6.46-11.42)***	3.75 (2.78-5.05)***
Not classified	7.86 (5.79-10.68)***	4.08 (2.60-6.40)***	2.45 (1.47-4.08)**	5.33 (3.89-7.31)***	4.20 (3.07-5.75)***	2.65 (1.89-3.70)***
Working status						
Working	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	1.66 (1.17-2.37)**	1.06 (0.69-1.63)	0.51 (0.33-0.81)**	2.71 (1.96-3.74)***	1.71 (1.23-2.37)**	0.83 (0.58-1.20)
Inactive	1.76 (1.40-2.20)***	3.17 (2.32-4.35)***	1.62 (1.16-2.26)**	2.90 (2.47-3.40)***	3.31 (2.75-4.00)***	1.69 (1.39-2.06)***
Household income (quintile)						
Highest	1.00	1.00	1.00	1.00	1.00	1.00
2	1.41 (0.91-2.18)	1.39 (0.88-2.19)	1.37 (0.86-2.17)	1.34 (1.01-1.78)*	1.50 (1.10-2.05)*	1.34 (0.97-1.85)
3	2.88 (1.95-4.26)***	2.59 (1.70-3.95)***	2.28 (1.46-3.56)***	2.30 (1.71-3.08)***	2.16 (1.59-2.93)***	1.56 (1.12-2.18)**
4	4.38 (2.88-6.66)***	4.12 (2.68-6.36)***	3.19 (1.98-5.12)***	3.94 (2.96-5.24)***	3.49 (2.57-4.75)***	1.96 (1.41-2.74)***
Lowest	5.97 (4.02-8.88)***	4.32 (2.84-6.56)***	3.11 (1.93-5.01)***	5.33 (4.04-7.03)***	4.34 (3.18-5.91)***	2.06 (1.47-2.89)***
Not applicable	4.02 (2.57-6.28)***	2.83 (1.71-4.67)***	2.66 (1.61-4.41)***	2.69 (1.91-3.81)***	2.13 (1.49-3.04)***	1.48 (1.03-2.13)*
Tenure						
Owner occupiers	1.00	1.00	1.00	1.00	1.00	1.00
Social Renters	3.09 (2.24-4.26)***	1.89 (1.37-2.60)***	1.07 (0.75-1.54)	2.67 (2.15-3.33)***	2.11 (1.72-2.59)***	1.28 (1.04-1.58)*
Private Renters	2.52 (1.86-3.41)***	1.48 (1.05-2.10)*	1.05 (0.71-1.55)	2.38 (1.82-3.11)***	1.81 (1.41-2.32)***	1.36 (1.06-1.75)*

Model 1: not adjusted. Model 2: adjusted for year of survey, age group, ethnicity, marital status and number of drink types. Model 3: adjusted for year of survey, age group, ethnicity, marital status, number of drink types, education, occupational social class, working status, household income and housing tenure. * p<0.05. ** p<0.01. *** p<0.001.

Table 3-2 Odds ratios (95% confidence intervals) for individual SES for former drinkers compared to lower risk drinkers.

	Men			Women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Education						
Degree or diploma	1.00	1.00	1.00	1.00	1.00	1.00
A-level or apprenticeship	1.14 (0.84-1.56)	1.28 (0.94-1.74)	1.10 (0.79-1.53)	1.14 (0.84-1.56)	0.88 (0.67-1.16)	0.74 (0.56-0.97)*
GCSE or equivalent	1.23 (0.93-1.62)	1.36 (1.03-1.79)*	1.02 (0.76-1.38)	1.23 (0.93-1.62)	1.34 (1.09-1.65)**	0.98 (0.79-1.22)
Other qualification	2.11 (1.48-3.00)***	1.80 (1.25-2.59)**	1.17 (0.79-1.72)	2.11 (1.48-3.00)***	2.37 (1.73-3.24)***	1.55 (1.13-2.13)**
No qualification	2.75 (2.12-3.56)***	2.22 (1.72-2.88)***	1.29 (0.96-1.74)	2.75 (2.12-3.56)***	2.49 (2.02-3.07)***	1.43 (1.14-1.80)**
Occupational social class						
Managerial and professional	1.00	1.00	1.00	1.00	1.00	1.00
Intermediate occupation	1.43 (1.10-1.86)**	1.34 (1.03-1.74)*	1.04 (0.77-1.39)	1.35 (1.11-1.65)**	1.27 (1.04-1.56)*	1.10 (0.89-1.36)
Routine and manual occupation	1.99 (1.61-2.46)***	1.85 (1.50-2.30)***	1.17 (0.90-1.52)	2.02 (1.70-2.39)***	1.89 (1.59-2.25)***	1.22 (1.00-1.49)*
Never worked and long-term unemployed	2.30 (1.53-3.46)***	2.42 (1.58-3.71)***	1.36 (0.87-2.13)	3.27 (2.34-4.59)***	3.32 (2.35-4.68)***	1.68 (1.18-2.39)**
Not classified	1.03 (0.68-1.55)	2.11 (1.25-3.57)**	1.25 (0.68-2.30)	0.81 (0.54-1.21)	1.19 (0.74-1.89)	0.86 (0.53-1.41)
Working status						
Working	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	1.66 (1.12-2.46)*	1.61 (1.05-2.47)*	0.94 (0.60-1.47)	1.03 (0.70-1.51)	1.07 (0.73-1.57)	0.68 (0.46-1.00)
Inactive	3.05 (2.54-3.67)***	3.25 (2.52-4.19)***	2.01 (1.51-2.66)***	2.56 (2.22-2.95)***	2.48 (2.07-2.96)***	1.70 (1.39-2.07)***
Household income (quintile)						
Highest	1.00	1.00	1.00	1.00	1.00	1.00
2	1.62 (1.16-2.28)**	1.63 (1.17-2.28)**	1.45 (1.03-2.04)*	1.34 (1.02-1.75)*	1.35 (1.03-1.78)*	1.23 (0.94-1.62)
3	2.53 (1.86-3.43)***	2.35 (1.73-3.21)***	1.75 (1.24-2.46)**	1.88 (1.46-2.43)***	1.81 (1.40-2.35)***	1.38 (1.05-1.80)*
4	4.38 (3.24-5.92)***	3.57 (2.61-4.88)***	2.09 (1.45-3.02)***	2.95 (2.29-3.80)***	2.58 (1.98-3.36)***	1.59 (1.20-2.11)**
Lowest	5.00 (3.63-6.88)***	4.00 (2.89-5.53)***	2.13 (1.44-3.15)***	3.59 (2.77-4.65)***	3.27 (2.49-4.31)***	1.81 (1.35-2.43)***
Not applicable	2.22 (1.46-3.38)***	2.00 (1.31-3.06)**	1.63 (1.04-2.56)*	1.96 (1.40-2.74)***	1.87 (1.34-2.61)***	1.50 (1.08-2.10)*
Tenure						
Owner occupiers	1.00	1.00	1.00	1.00	1.00	1.00
Social Renters	3.01 (2.42-3.75)***	2.74 (2.15-3.50)***	1.73 (1.32-2.28)***	2.33 (1.97-2.77)***	2.37 (1.97-2.85)***	1.53 (1.26-1.86)***
Private Renters	1.62 (1.22-2.16)**	2.10 (1.54-2.87)***	1.74 (1.26-2.38)**	1.28 (1.02-1.59)*	1.54 (1.21-1.95)***	1.27 (1.00-1.63)

Model 1: not adjusted. Model 2: adjusted for year of survey, age group, ethnicity, and marital status. Model 3: adjusted for year of survey, age group, ethnicity, marital status, education, occupational social class, working status, household income and housing tenure. * p<0.05. ** p<0.01. *** p<0.001.

Table 3-3 Odds ratios (95% confidence intervals) for individual SES for increasing risk drinkers compared to lower risk drinkers.

	Men			Women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Education						
Degree or diploma	1.00	1.00	1.00	1.00	1.00	1.00
A-level or apprenticeship	0.88 (0.75-1.02)	0.87 (0.75-1.01)	0.95 (0.82-1.12)	0.88 (0.75-1.02)	0.83 (0.71-0.98)*	0.92 (0.78-1.10)
GCSE or equivalent	0.75 (0.65-0.87)***	0.73 (0.63-0.85)***	0.85 (0.73-0.99)*	0.75 (0.65-0.87)***	0.76 (0.66-0.87)***	0.88 (0.76-1.03)
Other qualification	0.61 (0.49-0.76)***	0.69 (0.55-0.85)**	0.82 (0.66-1.03)	0.61 (0.49-0.76)***	0.68 (0.52-0.90)**	0.80 (0.59-1.07)
No qualification	0.63 (0.54-0.74)***	0.66 (0.56-0.77)***	0.83 (0.69-1.00)*	0.63 (0.54-0.74)***	0.47 (0.39-0.57)***	0.58 (0.47-0.71)***
Occupational social class						
Managerial and professional	1.00	1.00	1.00	1.00	1.00	1.00
Intermediate occupation	0.77 (0.66-0.90)**	0.77 (0.66-0.9)**	0.90 (0.77-1.07)	0.73 (0.64-0.83)***	0.76 (0.66-0.87)***	0.87 (0.75-1.01)
Routine and manual occupation	0.74 (0.65-0.84)***	0.75 (0.65-0.85)***	0.93 (0.81-1.08)	0.69 (0.61-0.79)***	0.73 (0.64-0.84)***	1.01 (0.86-1.19)
Never worked and long-term unemployed	0.39 (0.28-0.56)***	0.38 (0.26-0.55)***	0.47 (0.31-0.70)***	0.55 (0.39-0.76)***	0.59 (0.42-0.82)**	0.99 (0.70-1.40)
Not classified	0.52 (0.41-0.66)***	0.49 (0.37-0.66)***	0.60 (0.45-0.81)**	0.81 (0.65-1.00)	0.73 (0.56-0.96)*	0.92 (0.71-1.21)
Working status						
Working	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	0.71 (0.57-0.90)**	0.75 (0.59-0.94)*	1.12 (0.87-1.43)	0.65 (0.50-0.85)**	0.69 (0.53-0.91)**	0.83 (0.63-1.11)
Inactive	0.69 (0.61-0.78)***	0.7 (0.58-0.83)***	0.89 (0.74-1.07)	0.57 (0.50-0.63)***	0.67 (0.58-0.77)***	0.78 (0.67-0.92)**
Household income (quintile)						
Highest	1.00	1.00	1.00	1.00	1.00	1.00
2	0.75 (0.65-0.86)***	0.75 (0.65-0.87)***	0.79 (0.68-0.92)**	0.81 (0.71-0.93)**	0.81 (0.71-0.93)**	0.86 (0.75-0.99)*
3	0.63 (0.54-0.74)***	0.66 (0.56-0.77)***	0.73 (0.62-0.86)***	0.59 (0.51-0.69)***	0.63 (0.54-0.74)***	0.71 (0.61-0.84)***
4	0.48 (0.40-0.58)***	0.51 (0.42-0.62)***	0.60 (0.49-0.74)***	0.50 (0.42-0.59)***	0.59 (0.49-0.71)***	0.74 (0.61-0.90)**
Lowest	0.55 (0.45-0.66)***	0.56 (0.46-0.68)***	0.68 (0.55-0.84)***	0.46 (0.39-0.55)***	0.54 (0.44-0.65)***	0.71 (0.58-0.88)**
Not applicable	0.66 (0.54-0.80)***	0.67 (0.55-0.82)***	0.71 (0.58-0.88)**	0.74 (0.60-0.90)**	0.77 (0.63-0.95)*	0.85 (0.69-1.05)
Tenure						
Owner occupiers	1.00	1.00	1.00	1.00	1.00	1.00
Social Renters	0.69 (0.57-0.84)***	0.72 (0.59-0.88)**	0.95 (0.77-1.17)	0.57 (0.48-0.67)***	0.61 (0.51-0.72)***	0.81 (0.67-0.98)*
Private Renters	0.83 (0.69-1.01)	0.91 (0.75-1.11)	1.00 (0.82-1.22)	1.01 (0.84-1.21)	1.08 (0.89-1.30)	1.18 (0.98-1.43)

Model 1: not adjusted. Model 2: adjusted for year of survey, age group, ethnicity, and marital status. Model 3: adjusted for year of survey, age group, ethnicity, marital status, education, occupational social class, working status, household income and housing tenure. * p<0.05. ** p<0.01. *** p<0.001.

Table 3-4 Odds ratios (95% confidence intervals) for individual SES for higher risk drinkers compared to lower risk drinkers.

	Men			Women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Education						
Degree or diploma	1.00	1.00	1.00	1.00	1.00	1.00
A-level or apprenticeship	1.33 (1.05-1.69)*	1.29 (1.01-1.64)*	1.34 (1.04-1.73)*	1.33 (1.05-1.69)*	0.84 (0.64-1.10)	0.95 (0.71-1.26)
GCSE or equivalent	1.24 (1.00-1.53)*	1.18 (0.95-1.46)	1.23 (0.98-1.54)	1.24 (1.00-1.53)*	0.87 (0.68-1.11)	1.01 (0.77-1.33)
Other qualification	0.98 (0.66-1.45)	1.19 (0.79-1.79)	1.21 (0.80-1.84)	0.98 (0.66-1.45)	0.57 (0.33-0.98)*	0.62 (0.35-1.09)
No qualification	1.01 (0.79-1.29)	1.10 (0.85-1.43)	1.14 (0.85-1.52)	1.01 (0.79-1.29)	0.71 (0.52-0.97)*	0.80 (0.55-1.14)
Occupational social class						
Managerial and professional	1.00	1.00	1.00	1.00	1.00	1.00
Intermediate occupation	1.15 (0.90-1.47)	1.15 (0.90-1.46)	1.16 (0.91-1.48)	0.70 (0.55-0.88)**	0.73 (0.58-0.93)*	0.81 (0.62-1.04)
Routine and manual occupation	1.05 (0.87-1.27)	1.06 (0.88-1.28)	1.03 (0.83-1.27)	0.77 (0.62-0.96)*	0.82 (0.66-1.02)	0.95 (0.74-1.23)
Never worked and long-term unemployed	0.63 (0.36-1.09)	0.57 (0.32-1.02)	0.47 (0.25-0.87)*	0.91 (0.54-1.53)	0.95 (0.56-1.61)	1.07 (0.60-1.91)
Not classified	0.91 (0.64-1.31)	0.80 (0.53-1.20)	0.79 (0.51-1.21)	1.25 (0.85-1.83)	0.97 (0.63-1.49)	1.12 (0.73-1.73)
Working status						
Working	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	1.06 (0.78-1.44)	1.05 (0.77-1.44)	1.36 (0.95-1.95)	1.15 (0.75-1.78)	1.18 (0.78-1.79)	1.21 (0.79-1.84)
Inactive	0.78 (0.64-0.95)*	0.96 (0.73-1.27)	1.08 (0.82-1.41)	0.64 (0.53-0.77)***	0.91 (0.74-1.13)	0.94 (0.73-1.19)
Household income (quintile)						
Highest	1.00	1.00	1.00	1.00	1.00	1.00
2	0.89 (0.72-1.11)	0.90 (0.73-1.11)	0.83 (0.66-1.03)	0.67 (0.52-0.85)**	0.66 (0.51-0.84)**	0.67 (0.52-0.86)**
3	0.76 (0.59-0.97)*	0.81 (0.63-1.04)	0.70 (0.54-0.92)**	0.59 (0.44-0.78)***	0.63 (0.48-0.84)**	0.64 (0.47-0.87)**
4	0.69 (0.53-0.90)**	0.79 (0.60-1.03)	0.63 (0.47-0.85)**	0.51 (0.37-0.69)***	0.66 (0.47-0.91)*	0.64 (0.45-0.92)*
Lowest	0.90 (0.68-1.18)	0.93 (0.70-1.23)	0.73 (0.54-0.98)*	0.63 (0.47-0.85)**	0.77 (0.57-1.03)	0.73 (0.51-1.04)
Not applicable	0.87 (0.61-1.25)	0.91 (0.64-1.30)	0.81 (0.57-1.16)	0.69 (0.48-0.98)*	0.72 (0.50-1.03)	0.73 (0.50-1.06)
Tenure						
Owner occupiers	1.00	1.00	1.00	1.00	1.00	1.00
Social Renters	1.23 (0.96-1.58)	1.29 (1.00-1.65)*	1.43 (1.10-1.85)**	0.88 (0.66-1.18)	0.95 (0.71-1.27)	1.11 (0.79-1.56)
Private Renters	1.17 (0.90-1.52)	1.29 (0.98-1.70)	1.37 (1.03-1.81)*	1.69 (1.25-2.29)**	1.88 (1.37-2.58)***	2.01 (1.46-2.76)***

Model 1: not adjusted. Model 2: adjusted for year of survey, age group, ethnicity, and marital status. Model 3: adjusted for year of survey, age group, ethnicity, marital status, education, occupational social class, working status, household income and housing tenure. * p<0.05. ** p<0.01. *** p<0.001.

Table 3-5 Odds ratios (95% confidence intervals) neighbourhood deprivation (IMD2010 quintile) by respondents' drinking category compared to lower risk drinkers.

	Men			Women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
(Area level deprivation) IMD 2010 quintile						
Lifetime abstainer						
Least deprived (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
2	1.31 (0.85-2.04)	1.19 (0.78-1.82)	1.07 (0.70-1.63)	1.22 (0.93-1.60)	1.10 (0.86-1.42)	0.96 (0.74-1.23)
3	1.76 (1.13-2.76)*	1.40 (0.91-2.14)	1.09 (0.71-1.68)	1.66 (1.27-2.18)***	1.40 (1.10-1.79)**	1.08 (0.84-1.38)
4	1.69 (1.10-2.61)*	1.16 (0.76-1.78)	0.87 (0.56-1.36)	1.78 (1.36-2.31)***	1.40 (1.08-1.81)*	1.06 (0.82-1.36)
Most deprived	2.34 (1.51-3.64)*	1.55 (1.02-2.36)*	1.04 (0.66-1.61)	1.96 (1.51-2.53)***	1.60 (1.24-2.05)***	0.98 (0.75-1.28)
Former drinker						
Least deprived (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
2	1.37 (1.03-1.82)*	1.36 (1.02-1.82)*	1.24 (0.92-1.66)	1.12 (0.89-1.41)	1.12 (0.89-1.41)	1.02 (0.81-1.28)
3	1.34 (0.96-1.86)	1.34 (0.97-1.86)	1.05 (0.76-1.45)	1.50 (1.19-1.88)***	1.53 (1.22-1.92)***	1.27 (1.01-1.60)*
4	1.11 (0.82-1.51)	1.05 (0.77-1.45)	0.74 (0.54-1.01)	1.43 (1.14-1.78)**	1.44 (1.15-1.80)**	1.14 (0.90-1.45)
Most deprived	2.04 (1.52-2.74)***	1.97 (1.45-2.67)***	1.16 (0.85-1.59)	1.98 (1.58-2.47)***	2.03 (1.61-2.54)***	1.30 (1.03-1.65)*
Increasing risk						
Least deprived (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
2	1.06 (0.90-1.24)	1.06 (0.90-1.24)	1.10 (0.93-1.29)	0.95 (0.81-1.11)	0.96 (0.82-1.13)	0.99 (0.85-1.16)
3	0.95 (0.80-1.12)	0.96 (0.81-1.14)	1.05 (0.88-1.24)	0.93 (0.80-1.10)	0.94 (0.80-1.11)	1.03 (0.87-1.21)
4	0.89 (0.75-1.06)	0.91 (0.76-1.09)	1.01 (0.84-1.20)	0.82 (0.69-0.97)*	0.84 (0.71-1.00)	0.94 (0.79-1.13)
Most deprived	0.78 (0.65-0.94)**	0.81 (0.68-0.97)*	0.98 (0.81-1.20)	0.73 (0.61-0.88)**	0.76 (0.63-0.91)**	0.95 (0.78-1.16)
Higher risk						
Least deprived (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
2	0.99 (0.75-1.30)	0.98 (0.74-1.30)	0.96 (0.73-1.28)	1.07 (0.82-1.41)	1.08 (0.82-1.43)	1.10 (0.84-1.44)
3	0.97 (0.73-1.28)	0.98 (0.74-1.29)	0.96 (0.72-1.28)	0.93 (0.68-1.28)	0.93 (0.68-1.27)	0.95 (0.70-1.30)
4	1.02 (0.77-1.35)	1.03 (0.78-1.37)	1.00 (0.75-1.33)	1.04 (0.77-1.40)	1.06 (0.79-1.43)	1.11 (0.82-1.50)
Most deprived	1.31 (0.99-1.72)	1.34 (1.01-1.77)*	1.30 (0.96-1.75)	0.90 (0.66-1.22)	0.92 (0.68-1.26)	1.00 (0.72-1.39)

IMD, index of multiple deprivation. Model 1: not adjusted. Model 2: adjusted for year of survey, age group, ethnicity and marital status. Model 3: adjusted for year of survey, age group, ethnicity, marital status, education, occupational social class, working status, household income and housing tenure. * p<0.05. ** p<0.01. *** p<0.001.

Table 3-6 Odds ratios (95% confidence intervals) for individual SES among respondents drinking days on 5 or more days in the last week

	Odds ratio (95% CI)					
	Men			Women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Education						
Degree or diploma (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
A-level or apprenticeship	0.73 (0.63-0.85)***	0.77 (0.66-0.90)**	0.89 (0.76-1.05)	0.57 (0.47-0.69)***	0.70 (0.58-0.85)***	0.80 (0.66-0.98)*
GCSE or equivalent	0.61 (0.52-0.71)***	0.64 (0.54-0.75)***	0.77 (0.65-0.91)**	0.71 (0.62-0.83)***	0.66 (0.56-0.77)***	0.79 (0.67-0.94)**
Other qualification	0.67 (0.53-0.85)**	0.55 (0.43-0.69)***	0.68 (0.53-0.86)**	0.92 (0.69-1.23)	0.67 (0.50-0.89)**	0.80 (0.60-1.08)
No qualification	0.78 (0.67-0.91)**	0.55 (0.47-0.65)***	0.72 (0.60-0.86)***	0.75 (0.64-0.89)**	0.45 (0.37-0.55)***	0.58 (0.47-0.72)***
Occupational social class						
Managerial and professional (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Intermediate occupation	0.75 (0.65-0.86)***	0.73 (0.63-0.84)***	0.86 (0.74-1.00)*	0.80 (0.69-0.92)**	0.71 (0.61-0.82)***	0.86 (0.74-1.01)
Routine and manual occupation	0.59 (0.52-0.67)***	0.59 (0.51-0.67)***	0.74 (0.64-0.86)***	0.64 (0.56-0.74)***	0.59 (0.51-0.67)***	0.84 (0.72-0.99)*
Never worked and long-term unemployed	0.45 (0.32-0.63)***	0.58 (0.42-0.81)**	0.70 (0.50-0.99)*	0.89 (0.64-1.23)	1.10 (0.78-1.55)	1.51 (1.08-2.12)*
Not classified	0.27 (0.19-0.37)***	0.56 (0.39-0.82)**	0.61 (0.42-0.89)*	0.25 (0.18-0.36)***	0.64 (0.44-0.93)*	0.74 (0.51-1.08)
Working status						
Working (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	0.68 (0.52-0.87)**	0.84 (0.65-1.07)	1.09 (0.82-1.46)	0.64 (0.45-0.92)*	0.87 (0.60-1.27)	1.04 (0.72-1.51)
Inactive	1.59 (1.42-1.78)***	1.03 (0.86-1.23)	1.25 (1.04-1.5)*	1.39 (1.23-1.56)***	0.92 (0.79-1.07)	1.10 (0.94-1.29)
Household income (quintile)						
Highest (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
2	0.79 (0.69-0.91)**	0.76 (0.66-0.87)***	0.85 (0.73-0.98)*	0.74 (0.63-0.87)***	0.70 (0.60-0.83)***	0.78 (0.65-0.92)**
3	0.76 (0.65-0.88)***	0.65 (0.55-0.76)***	0.78 (0.66-0.93)**	0.66 (0.55-0.78)***	0.56 (0.47-0.67)***	0.66 (0.54-0.80)***
4	0.82 (0.70-0.97)*	0.59 (0.50-0.70)***	0.74 (0.61-0.90)**	0.69 (0.58-0.83)***	0.49 (0.41-0.60)***	0.62 (0.50-0.77)***
Lowest	0.74 (0.60-0.92)**	0.62 (0.50-0.78)***	0.75 (0.60-0.94)*	0.59 (0.49-0.71)***	0.48 (0.39-0.60)***	0.61 (0.48-0.76)***
Not applicable	1.02 (0.85-1.24)	0.86 (0.71-1.05)	0.97 (0.80-1.17)	0.91 (0.74-1.12)	0.73 (0.59-0.90)**	0.81 (0.65-1.00)
Tenure						
Owner occupiers	1.00	1.00	1.00	1.00	1.00	1.00
Social Renters	0.65 (0.52-0.80)***	0.69 (0.56-0.85)***	0.89 (0.72-1.10)	0.53 (0.42-0.66)***	0.64 (0.51-0.80)***	0.86 (0.67-1.10)
Private Renters	0.70 (0.58-0.86)**	1.04 (0.84-1.29)	1.16 (0.93-1.43)	0.61 (0.48-0.78)***	1.05 (0.81-1.36)	1.17 (0.90-1.53)

Model 1: not adjusted. Model 2: adjusted for survey year, age group, ethnicity and marital status. Model 3: adjusted for survey year, age group, ethnicity, marital status, education, occupational social class, working status, household income and housing tenure. * p<0.05. ** p<0.01. *** p<0.001.

Table 3-7 Odds ratios (95% confidence intervals) for individual SES for respondents reporting regular binge drinking

	Odds ratio (95% CI)					
	Men			Women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Education						
Degree or diploma (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
A-level or apprenticeship	1.53 (1.29-1.83)***	1.54 (1.29-1.84)***	1.39 (1.15-1.68)**	1.68 (1.35-2.08)***	1.35 (1.09-1.67)**	1.37 (1.09-1.73)**
GCSE or equivalent	1.56 (1.33-1.83)***	1.59 (1.35-1.88)***	1.39 (1.16-1.67)***	1.44 (1.20-1.72)***	1.47 (1.21-1.78)***	1.46 (1.17-1.81)**
Other qualification	1.04 (0.77-1.41)	1.75 (1.28-2.38)***	1.46 (1.06-2.01)*	0.64 (0.43-0.94)*	1.41 (0.94-2.12)	1.32 (0.86-2.03)
No qualification	1.09 (0.89-1.33)	2.01 (1.61-2.52)***	1.74 (1.36-2.23)***	0.76 (0.61-0.95)*	1.79 (1.41-2.28)***	1.68 (1.28-2.21)***
Occupational social class						
Managerial and professional (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Intermediate occupation	1.27 (1.05-1.53)*	1.38 (1.15-1.67)**	1.25 (1.02-1.52)*	0.82 (0.67-1.00)*	0.98 (0.80-1.20)	0.87 (0.70-1.09)
Routine and manual occupation	1.50 (1.29-1.73)***	1.69 (1.44-1.98)***	1.40 (1.17-1.67)***	1.13 (0.95-1.34)	1.39 (1.15-1.66)***	1.13 (0.90-1.42)
Never worked and long-term unemployed	0.79 (0.51-1.22)	0.71 (0.44-1.14)	0.52 (0.32-0.85)**	1.21 (0.83-1.76)	1.25 (0.81-1.93)	1.04 (0.65-1.67)
Not classified	1.47 (1.13-1.91)**	0.91 (0.66-1.24)	0.87 (0.63-1.21)	2.20 (1.63-2.96)***	1.23 (0.88-1.73)	1.22 (0.85-1.74)
Working status						
Working (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Unemployed	1.15 (0.92-1.44)	1.08 (0.84-1.38)	1.19 (0.91-1.56)	1.43 (1.09-1.89)*	1.30 (0.97-1.73)	1.09 (0.81-1.47)
Inactive	0.39 (0.33-0.47)***	0.75 (0.60-0.92)**	0.74 (0.59-0.92)**	0.43 (0.36-0.51)***	0.86 (0.72-1.04)	0.74 (0.61-0.90)**
Household income (quintile)						
Highest (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
2	1.15 (0.98-1.36)	1.25 (1.06-1.48)**	1.06 (0.89-1.27)	1.03 (0.85-1.25)	1.08 (0.89-1.32)	0.96 (0.79-1.18)
3	0.91 (0.75-1.12)	1.18 (0.96-1.45)	0.92 (0.74-1.15)	0.95 (0.76-1.18)	1.14 (0.91-1.43)	0.92 (0.72-1.18)
4	0.63 (0.51-0.79)***	1.02 (0.80-1.29)	0.75 (0.58-0.97)*	0.74 (0.59-0.94)*	1.24 (0.97-1.58)	0.92 (0.70-1.22)
Lowest	0.99 (0.80-1.22)	1.30 (1.04-1.63)*	1.04 (0.80-1.35)	0.87 (0.68-1.12)	1.24 (0.96-1.60)	0.90 (0.67-1.20)
Not applicable	0.94 (0.71-1.24)	1.20 (0.91-1.58)	1.04 (0.79-1.36)	0.78 (0.58-1.03)	0.97 (0.72-1.30)	0.87 (0.64-1.17)
Tenure						
Owner occupiers	1.00	1.00	1.00	1.00	1.00	1.00
Social Renters	1.33 (1.10-1.61)**	1.48 (1.21-1.81)***	1.41 (1.13-1.76)**	1.38 (1.13-1.67)*	1.47 (1.19-1.81)***	1.35 (1.05-1.73)*
Private Renters	1.28 (1.04-1.57)*	1.05 (0.85-1.30)	1.05 (0.85-1.32)	2.09 (1.68-2.60)***	1.68 (1.36-2.09)***	1.70 (1.36-2.12)***

Model 1: not adjusted. Model 2: adjusted for year of survey, age group, ethnicity, marital status and number of drink types. Model 3: adjusted for year of survey, age group, ethnicity, marital status, number of drink types, education, occupational social class, working status, household income and housing tenure. * p<0.05. ** p<0.01. *** p<0.001.

Table 3-8. Odds ratios (95% confidence intervals) for neighbourhood deprivation (IMD2010 quintile) by respondents' pattern of alcohol consumption

	Men			Women		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Drinking on 5 or more days in last week vs. less than 5 days						
Least deprived	1.00	1.00	1.00	1.00	1.00	1.00
2	1.01 (0.86-1.18)	1.04 (0.89-1.22)	1.09 (0.94-1.28)	0.81 (0.69-0.95)**	0.82 (0.70-0.96)*	0.86 (0.74-1.01)
3	0.89 (0.75-1.06)	0.94 (0.80-1.12)	1.05 (0.89-1.25)	0.77 (0.65-0.93)**	0.86 (0.71-1.03)	0.95 (0.79-1.14)
4	0.75 (0.61-0.91)**	0.82 (0.67-0.99)*	0.95 (0.78-1.15)	0.63 (0.52-0.77)***	0.71 (0.59-0.87)**	0.82 (0.67-0.99)*
Most deprived	0.73 (0.61-0.87)***	0.81 (0.68-0.97)*	1.03 (0.85-1.25)	0.50 (0.40-0.62)***	0.60 (0.48-0.74)***	0.76 (0.61-0.94)*
Regular binge drinking vs. no regular binge drinking						
Least deprived	1.00	1.00	1.00	1.00	1.00	1.00
2	1.22 (0.97-1.53)	1.19 (0.95-1.50)	1.15 (0.92-1.45)	1.24 (0.95-1.61)	1.23 (0.95-1.60)	1.21 (0.94-1.56)
3	1.30 (1.03-1.64)*	1.25 (0.99-1.58)	1.19 (0.94-1.51)	1.29 (1.00-1.65)*	1.18 (0.92-1.51)	1.11 (0.87-1.42)
4	1.37 (1.08-1.72)**	1.31 (1.04-1.65)*	1.19 (0.94-1.51)	1.43 (1.12-1.82)**	1.36 (1.06-1.74)*	1.28 (0.99-1.65)
Most deprived	1.61 (1.27-2.04)***	1.53 (1.21-1.95)***	1.33 (1.03-1.71)*	1.60 (1.24-2.07)***	1.48 (1.14-1.93)**	1.32 (0.99-1.75)

IMD, index of multiple deprivation. Model 1: not adjusted. Model 2: adjusted for year of survey, age group, ethnicity, marital status and number of drink types (regular binge drinking only). Model 3: adjusted for year of survey, age group, ethnicity, marital status, number of drink types (regular binge drinking only), education, occupational social class, working status, household income and housing tenure. * p<0.05. ** p<0.01. *** p<0.001.

4 WORK STREAM 3: ACCURATE ESTIMATES OF NATIONAL ALCOHOL CONSUMPTION

4.1 Overview

We undertook a national alcohol survey to collect more accurate estimates of alcohol consumption levels and patterns in England. The national survey developed for the study was based on a newly constructed set of questions designed to elicit more accurate recall of alcohol consumption among the general population. In keeping with other general population surveys, the main survey measures were questions about alcohol consumption in the past year, and questions about age of initiation of alcohol use and drinking history. Participants were also asked whether they had ever experienced a serious alcohol-related problem across five domains, and use of health services such as hospitals and casualty. Questions about alcohol consumption in the past year asked for additional detail about patterns of alcohol use on typical occasions, non-typical occasions (on which participants reported drinking 'a bit more', 'a lot more' and 'less' than on typical occasions) and on special occasions (from a list of 16 types). The use of these types of questions was predicted to yield more accurate alcohol use estimates. We also administered a modified version of the national survey to two additional samples (students and clients of hostels) usually underrepresented in national estimates of alcohol consumption in order to better understand how much alcohol use such groups are likely to contribute to national estimates.

4.2 Methodology

4.2.1 National survey

To develop the questions used in the national survey we drew on studies of alternative survey methods in order to better represent alcohol consumption.^{8, 60} The survey was designed to maximise responder input and included questions about alcohol consumption on: (i) typical and non-typical days (examples of non-typical days were when the respondent drank more, or less, than usual); (ii) on different types of occasions (e.g. Christmas holidays, vacations, birthday celebration); and (iii) in the past.²⁸ The full questionnaire is provided in Appendix 1.

The survey was undertaken by an in-house telephone research team using a stratified random sampling design. For the telephone household survey, we requested 60,000 randomly selected English landline numbers, stratified by geographic region and Index of Multiple Deprivation (IMD) decile. We aimed to

survey 6,000 adults aged 16 years and over. It was planned that 5,100 participants would be contacted via a household telephone and 900 participants (15% of the sample) would be contacted via a mobile telephone. Mobile phone users were targeted specifically because 15% of UK households are now mobile phone only households. These individuals are more likely to be younger and living in more deprived areas. However, due to a poor response rate the target for the mobile phone sample was reduced to 600 and the landline target sample increased as data collection progressed.

Households were screened to identify the number of adults aged 16 years and over who were living there; where more than one adult lived in the household, one individual was randomly selected to participate using the next birthday method. For the mobile telephone survey, telephone numbers were randomly selected. Because mobile phone records are not linked directly to a postal address, participants in the mobile survey were asked for their postcode for analysis purposes.

4.2.2 Sampling of populations underrepresented in national estimates

We additionally surveyed two target populations that are known to be underrepresented in national survey estimates of alcohol consumption. Our plan of analysis included the development of an online surveys for students (target sample n=500) from universities in three cities and semi-structured interviews with homeless people and recently-released prisoners (target sample n=200), accessed through hostel accommodation providers in three cities.

Students

The questionnaire used in the national survey was also administered to students (see Appendix 1). Based on piloting of the final questionnaire developed for the national survey, we changed our planned data collection approach for the student surveys to face-to-face interviews. Students were therefore recruited on nine University campuses in Birmingham, Leeds, Liverpool and Oxford. In addition, one University consented for the research team to recruit students at a Fresher's fair. Rather than being interviewed at the time of recruitment, students recruited at the Fresher's fair received a call back from a member of the in-house telephone team. All students who were approached for participation were provided with a participant information sheet and received a £5 shopping voucher for completing the survey.

Hostel sample - Homeless population & recently released prisoners

A semi-structured survey was developed based on the approach used in the national survey but differing in some key aspects. The questionnaire for hostel clients included questions tailored to the population, for example, asking about time in prison and time in alcohol treatment. Participants were not asked about drinking on special occasions, but were instead asked more broadly about periods when their drinking had changed, and why, using a semi-structured approach. The full questionnaire used with this population is provided in Appendix 1. Participants were recruited across 12 hostel services in Leeds, Liverpool and London. The sample included rough sleepers, recently released prisoners, and people living in hostels or using housing services because they had been, or were at risk of becoming, homeless.

4.2.3 Data screening

Weekly data screening tests were conducted throughout the collection of the national survey data to examine the quality of data collected in the preceding week. Any problems with data collection were fed directly back to the Telephone Research Team in a weekly monitoring meeting. A survey coding manual was developed and prior to analysis, all three datasets were screened using the following methods: data cleaning, methods for handling missing data (e.g. listwise or pairwise deletion; imputation procedures; expectation maximization), and recoding of outliers. The distribution of each variable was inspected to check for data entry errors and for the national survey a sample of errors checked through listening to recordings of survey calls.

4.2.4 Data analysis

Data obtained through the national survey was retrospectively weighted with respect to the English general population according to the demographics (sex, age, ethnicity, working status, level of deprivation; based on Census 2011 for those aged 16+) and geographic characteristics (population size weighting in accordance with size of Government Office region) of respondents, in order to generate more representative estimates of national alcohol consumption levels and patterns. Sample demographics are also reported using the unweight dataset, but alcohol behaviour is reported using the weighted data.

The data obtained through the surveys of the two underrepresented populations was used to make qualitative comparisons, and to draw conclusions about the

impact of inclusion of underrepresented groups might have on national estimates of alcohol consumption.

4.3 Summary of findings

4.3.1 National survey

Sample demographics

In total, 6,833 individuals participated in the survey between May 2013 and April 2014, 6,219 via landline telephone, 612 via mobile telephone and 2 via inbound calls. As a proportion of dialled calls, the participation rate for landline numbers was 9.2% and 6.8% for mobiles. For answered calls, the refusal rate was 76.7%. Following data screening and checking we were left with complete records with information on sex, age, typical alcohol consumption and quintile of deprivation for 6,089 respondents (89.1%). Of the complete records, 5,615 (92.2%) interviews had been conducted via landlines, 472 (7.8%) via mobile phone and 2 (<0.001%) were 'inbound calls'. Respondents interviewed via mobile telephone were more likely to be male (12.1% male vs. 5.3% female; *p* for trend <0.001). For a summary of sample demographic estimates see Table 4.1a (unweighted data; for comparison the weighted estimates are shown in Table 4.1b).

Unweighted sample description (Table 4.1a)

The sex distribution of the sample comprised 64.5% females, and 35.5% males. Mean age was 56.8 ± 17.2 (range 16-97). White British respondents comprised 88.3% of the sample, and 61.6% were married, cohabiting or in a civil partnership. 40.4% were in full, part time, or self-employment, 44.3% were retired; 3.7% were students and 4.9% were unemployed. 18.2% of the population were estimated to have no formal qualifications, whilst 32.1% reported higher education qualifications (Bachelors, Masters, and PhD).

With respect to area of residence (Government Office Region), 9.0% of respondents lived in the East Midlands; 11.4% East of England; 10.2% London; 5.4 % North East; 16.4% North West; 15.7% South East; 11.8% South West; 10.2% West Midlands; and 9.9% Yorkshire and The Humber

Weighted population estimates (Table 4.1b)

Applying weighting yielded an estimated sex distribution of 51.3% females, and 48.7% males. Mean age was 46.6 ± 18.5 (range 16-97). White British respondents

were estimated as 81.7% of the population, and 52.1% were married, cohabiting or in a civil partnership. 55.5% were in full, part time, or self-employment, 21.1% were retired; 5.7% were students and 7.1% were unemployed. 11.2% of the population were estimated to have no formal qualifications, whilst 36.2% reported higher educational qualifications (Bachelors, Masters, and PhD).

With respect to area of residence (Government Office Region), 8.6% of the estimated population lived in the East Midlands; 11.0% East of England; 15.2% London; 5.0 % North East; 13.3% North West; 16.3% South East; 10.1% South West; 10.5% West Midlands; and 10.0% Yorkshire and The Humber

Drinking status (see Tables 4.2-4.3)

Drinking status was categorised according to whether respondents were non-drinkers, had not drunk alcohol in last year, or were current drinkers (i.e. had drunk alcohol in the last year), and estimated for the population. The estimated proportion of current drinkers was 77.0% (79.0% of men and 75.1% of women), although drinking status did not differ significantly by sex (Pearson chi-square =0.502; Cramer's V = 0.048). 15.6% were estimated not to have drunk in the previous year (13.9%; 17.0%; Pearson chi-square =0.344; Cramer's V = 0.041, NS), and 7.4% (7.1%; 7.7% Pearson chi-square =0.072; Cramer's V = 0.019) self-reported being non-drinkers. Table 4.2 provides population estimates by age.

Types of drinking days

Respondents who had drunk in the previous year were asked whether compared to a typical drinking day they had days when they drank (i) 'a bit more', (ii) 'a lot more' or (iii) 'less'. 74.9% of men and 68.3% of women reported days where they drank 'a bit more', 24.6% of men and 21.2% of women a 'lot more'; and 53.6% of men and 45.4% of women 'less'.

Respondents who had drunk alcohol in the previous year were also asked whether in addition to their typical and non-typical days their drinking had changed on special occasions. Most drinkers (77.8%; 79.5% male, 76.0% female) reported a change in frequency and quantity, or both, on at least one of the 10 types of special occasion that occurred over a period (see questionnaire in Appendix 1 for these occasions). Fewer respondents (27.0%) reported a change in their drinking quantity on at least one of the six types of individual special occasions.

Drinking frequency

Based on participant's frequency of drinking on typical days only, 47.5% of men and 33.6% of women reported drinking on at least one day of the week and 9.4% of

men and 4.5% of women reported drinking most days of the week (i.e. 5 days or more).

When non-typical days and special occasions were accounted for, the distribution shifted towards a higher frequency of consumption (Figure 4.1). Drinking on at least one day of the week was reported by 64.8% of men and 53.5% of women and the proportion of men and women drinking on most days of the week increased to 13.6% and 7.2 % respectively.

With the addition of non-typical and special occasion days, drinking frequency changed for 70.0% of participants. Among men, 65.8% had an increased drinking frequency when non-typical and special occasion days were accounted for and 1.0% had a reduced frequency^{iv}; comparative proportions of women were 71.3% and 0.8%, respectively.

^{iv} This possibility arises as participants were able to report that they had not drunk alcohol during special occasion periods.

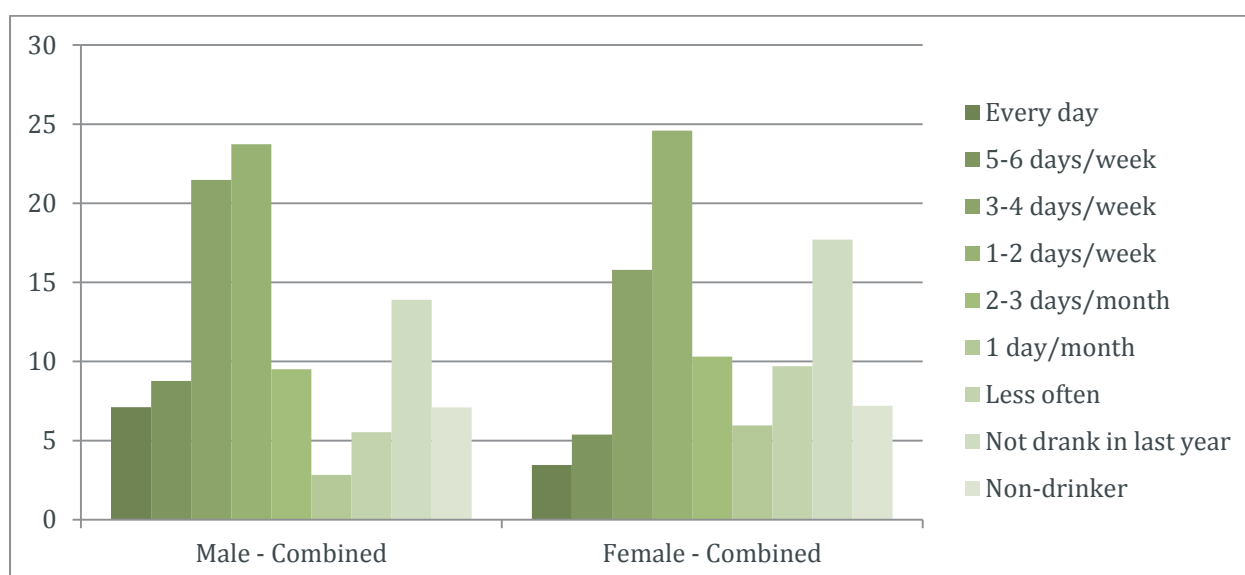
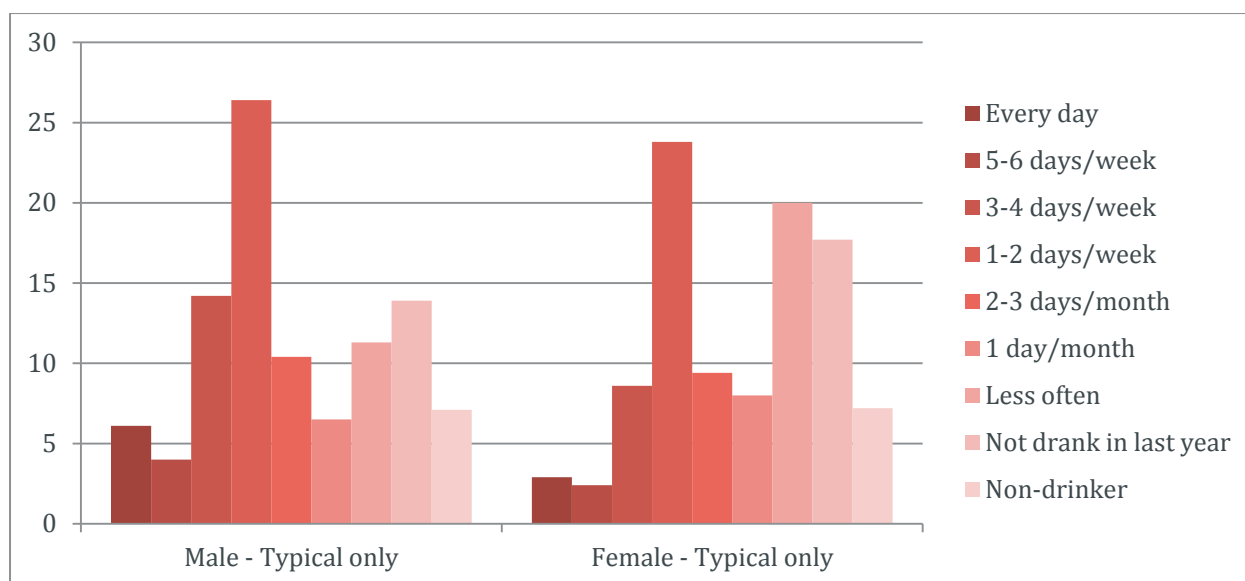


Figure 4.1 National survey: drinking frequency in last year comparing typical days with estimates accounting for non-typical and special occasions

Drinking quantity (Table 4.3)

The number of units consumed on drinking days differed between typical and non-typical drinking occasions. Mean consumption on typical days was 7.6 ± 7.7 units for men and 5.0 ± 4.8 units for women (last year drinkers only). On days when respondents drank a 'bit more' mean consumption increased to 14.8 ± 12.4 units and 9.3 ± 6.2 units, respectively.

Mean consumption on days when respondents drank a 'lot more' was 22.4 ± 12.8 units for men and 15.6 ± 9.3 units for women; and on days when respondents drank 'less' were 3.1 ± 2.2 units and 2.2 ± 1.3 units, respectively.

Weekly alcohol consumption (Table 4.3)

Mean weekly consumption on typical days only was 16.1 ± 34.2 units for men and 7.0 ± 10.8 units for women. When non-typical day and special occasion days were also accounted for, mean weekly consumption increased to 20.1 ± 41.5 units for men (24.8% increase) and to 9.5 ± 13.1 units for women (35.7% increase).

Respondents were categorised into alcohol risk groupings (non-drinkers, lower, increasing, and higher risk) according to their reported weekly consumption across typical, non-typical and special occasions.

Considering typical weekly consumption alone, the majority of participants were categorised as lower risk drinkers (0 to 21 units per week for men and 0 to 14 units per week for women); 77.5% of men and 84.1% of women. For increasing risk categories the proportions were 16.6% (21-50 units) and 13.3% (14-35 units) respectively; and for higher risk, 5.9% (>50 units) and 2.6% (>35 units).

With the addition of non-typical and special occasions, fewer participants were classed as lower risk, 69.4% of men and 76.3% of women. There was a corresponding increase in both increasing risk (21.7%; 18.7% respectively), and higher risk categories (8.9%; 4.9% respectively).

We examined the associations between demographic factors (sex, ethnicity, employment status, IMD), alcohol use (drinking risk category, units consumed/week), and smoking status and the magnitude of difference between the number of weekly alcohol units captured by the two sets of questions (data not shown in tables). Only two variables were identified as significant predictors, male sex ($B = -0.74$; $p < 0.01$), and the combined estimate of weekly consumption ($B=0.22$, $p < 0.001$). This meant that men tended to report less of a difference between the two estimates, but heavier drinkers reported a greater degree of magnitude.

Drinking risk and self-reported alcohol use

We analysed whether differences in alcohol reporting differed by drinking risk classification (full data not shown in the tables). Comparing to typical drinking estimates, the combined total weekly alcohol intake increased by 29.1% in lower risk males, 25.2% in increasing risk men, and 24.4% in higher risk men. For females, the respective increases were 33.3%, 38.6%, and 39.9%.

Socioeconomic status and self-reported alcohol use

Frequency of drinking and weekly alcohol unit intake was reanalysed with respect to the IMD quintile of respondents. As shown in Table 4.3 the distribution of drinking

frequency differed between IMD quintiles, with a greater proportion of the more deprived quintiles reporting both drinking in the previous year, and more frequent drinking. Although the least deprived quintiles tended to self-report greater typical last week unit consumption, this did not significantly differ between groups ($F_{4,4686} = 1.186$; $p = 0.315$).

With the addition of non-typical and special occasions, there was a significant increase in weekly unit estimate, regardless of IMD quintile (IMD quintile 1, $t = 9.660$, $p < 0.001$; 2, $t = 7.696$, $p < 0.001$; 3, $t = 11.213$, $p < 0.000$; 4, $t = 13.852$, $p < 0.001$; 5, $t = 11.924$, $p < 0.001$). Comparing quintiles, there was a statistically significant difference between quintiles on weekly alcohol unit change across typical vs combined estimates ($F_{4,4529} = 2.245$; $p < 0.05$), although this change was independent of the sex of the respondent ($F_{4,4529} = 1.526$, $p = 0.192$). However, the difference in units reported only differed between quintiles 5 (most deprived) and 2 ($p < 0.05$), suggesting that there was not a clear relationship between IMD and reporting of alcohol consumption.

Drinkers were categorised according to whether they self-reported exceeding the UK Government weekly alcohol unit limits (21 for males, 14 for females). Two separate regression analyses were conducted in order to compare the estimates of the odds of exceeding these thresholds when using either typical drinking estimates, or the combined estimate. In these analyses the effects of age, sex, deprivation quintile, and Government Office of residence were controlled. Firstly, considering typical drinking estimates, older age and being male were associated with increased odds of reporting drinking in excess of Government guidelines (see Table 4.4a). Living in IMD quintiles 4 and 2 (compared with quintile 5 (most deprived)), and living in the East Midlands, East of England, London, North East, South West, and West Midlands (compared with Yorkshire and the Humber) were associated with decreased odds. This profile changed slightly when non-typical and special occasion drinking was taken into consideration. Although age was no longer a significant predictor, living in the South East or IMD quintile 1 (least deprived) were now associated with reduced odds of reporting in excess of the threshold.

As shown in tables 4.4b and 4.4c, comparing the most deprived quintiles to all others, there were significant differences in the (unadjusted) odds ratios of being classed as lower, increasing or high risk drinkers when taking non-typical and special occasions into account. In general, respondents in the most deprived quintile were less likely to be classed as lower risk drinkers when taking into account additional drinking occasions, but the odds of being classed as higher risk were no longer significant when compared to the least deprived quintile.

As alcohol use is influenced by a range of factors such as age, sex, and ethnicity, a series of additional multivariate analyses were conducted in order to examine the association between SES and drinking behaviours (last year drinkers only) (Table 4.5). All analyses were undertaken using combined drinking estimates (i.e. typical, special, and non-typical occasions).

After controlling for important factors (age, sex, ethnicity, employment status, self-reported health and life satisfaction rating, smoking status, BMI), living in the most deprived quintile (5) or quintile 4 (second most deprived quintile) were associated with higher odds, compared to the least deprived, of being classed as a drinker at 'increasing risk' (AOR = 1.62; 1.27-2.07, $p < 0.01$; AOR = 1.34; 1.04-1.72, $p < 0.05$ respectively) (Table 4.5). However, this relationship was not retained for the 'higher risk' classification analysis (AOR = 0.67; 0.41-1.10, $p = \text{NS}$), although the odds ratios for quintiles 2 (AOR = 1.53; 1.05-2.24, $p < 0.05$) and 3 (AOR = 1.59; 1.09-2.32, $p < 0.05$) compared to the least deprived quintile were significant. Finally, the odds ratio of self-reporting that drinking had caused a serious (health, relationship, financial, social) problem was significant when comparing quintile 3 with 1 (AOR = 1.55; 1.02-2.34, $p < 0.05$).

Finally, in an extension of the GLS analysis reported in Section 3.2.4, we explored self-rated health, outpatient or casualty use in the previous 12 months, and in-patient hospital stays in the previous 12 months, as a function of deprivation and drinking risk. Only participants reporting drinking in the previous 12 months were included in this analysis. Three regression models were estimated; the first examined the relationship between IMD quintile and each health variable; the second model added in the derived drinking risk classification; finally, to control for the influence of other individual level socioeconomic and demographic indicators (age, sex, ethnicity, smoking status, exercise, fruit and vegetable consumption, life satisfaction, and employment status) the third model included all three sets of variables (see Table 4.6).

Model 1 (IMD only) suggested that living in quintiles 1 (OR = 0.38; 0.23-0.61, $p < 0.001$) or 2 (OR = 0.59; 0.35-0.99, $p < 0.05$) were associated with lower odds of self-reported good health compared to quintile 5, but there was no relationship between IMD and outpatient/casualty use or in-patient hospital stays in the previous 12 months.

Adding alcohol risk into the model (Model 2) showed that whilst controlling for IMD, alcohol use was a significant predictor. Compared to higher risk category drinkers, lower (AOR = 2.44; 1.55-3.83, $p < 0.001$) and increasing risk (AOR = 2.89; 1.63-5.13, $p < 0.001$) drinkers were more likely to self-report good health, and less likely to report outpatient/casualty presentation (AOR = 0.53; 0.41-0.70, $p < 0.001$; AOR = 0.52; 0.38-

0.72, $p < 0.01$). Increasing risk drinkers were also less likely to report an inpatient hospital stay compared to higher risk drinkers (AOR = 0.64; 0.42-0.97, $p < 0.05$). The inclusion of alcohol risk variables attenuated the finding for quintile 2 on self-rated health (AOR = 0.62; 0.37-1.04,) suggesting that this finding was not independent of alcohol consumption. However, the association between IMD 1 was independent of alcohol use (AOR = 0.38; 0.23-0.62, $p < 0.001$). Finally, the number of drinking days in a typical week (taking into account typical and non-typical days) was only significantly associated with an inpatient stay in the previous year.

Findings for most of these health related variables did not appear to be confounded by the inclusion of the remaining individual variables (Model 3). IMD 1 residents were still less likely (AOR = 0.42; 0.25-0.69, $p < 0.05$), and lower (AOR = 2.08; 1.28-3.39, $p < 0.01$) and increasing (AOR = 3.14; 1.71-5.76, $p < 0.001$) risk drinkers more likely, to self-report good health. Similarly, lower (AOR = 0.62; 0.47-0.83, $p < 0.01$), and increasing (AOR = 0.59; 0.42-0.81, $p < 0.01$), risk drinkers were less likely to have attended outpatient services in the previous 12 months than higher risk drinkers. However, there was no longer a significant association between the total number of drinking days per week and at the odds of at least one hospital stay in the previous year. Finally, increased life satisfaction and fruit and vegetable consumption per day were both associated with decreased odds of attending outpatient or casualty in the previous year. Higher self-reported life satisfaction was associated with increased likelihood of self-reporting good health.

4.3.2 Student survey – summary of findings

Sample demographics

A total of 508 students provided complete interview data. The majority of interviews were conducted face-to-face, on campus ($n=456$) with an additional 52 carried out over the telephone. Respondents were aged between 17 and 51 years with a mean age of 21.3 (SD 4.6) years; 87.8% were less than 24 years old. Just over half were female (56.7%) and two thirds of respondents described their ethnicity as White British (65.7%). Ethnic group differed significantly by sex (Pearson Chi-square 35.973; Cramer's V 0.266); more men than women described their ethnicity as Asian or Asian British (23.2% vs. 11.1%). Over two thirds (70.6%) of respondents were single. All participants were students, with a further third (33.3%) also employed. Over two thirds (72.6%) had A level qualifications and/or were still studying (12.4%) and a further 12.2% held higher education qualifications (Bachelor, Master, PhD).

Drinking status

All participants were categorised according to whether they were non-drinkers, had not drank alcohol in last year, or were current drinkers (i.e. had drank alcohol in the last year). The majority of students reported that had drank alcohol in the last year (88.0%). A small proportion had not drank any alcohol in the last year (3.0%) and the remainder were non-drinkers (9.0%). Although the distribution of drinking status by sex was not statistically significant (Pearson chi-square = 3.598; Cramer's V = 0.084), almost twice as many men than women reported being non-drinkers (11.8% vs. 6.9%). Drinking status did however differ significantly by ethnicity (Pearson chi-square = 316.606; Cramer's V = 0.789) with 82.6% of non-drinkers describing their ethnicity as Asian or Asian British.

Types of drinking days

Respondents who had drank in the previous year were asked whether compared to a typical drinking day they had days when they drank (i) 'a bit more', (ii) 'a lot more' or (iii) 'less'. Most students who drank (95.5%) reported having at least one of the three types of non-typical drinking days instead of or as well as their typical drinking days; 95.1% of men and 95.8% of women. The majority of drinkers (88.6%) reported having 'bit more' days, 53.9% reported having 'lot more' days and 74.3% reported having 'less' days. Across all three types of non-typical drinking days, around two thirds of drinkers reported that their non-typical days had occurred 'instead of' (63.5%) their typical drinking days and a quarter had non-typical days 'as well as' (25.1%) their typical drinking days. Just over a quarter of drinkers (26.0%) reported having 'bit more' and 'lot more' days instead of or as well as their typical days. Over a third of drinkers (40.0%, n=183) reported having all three types of non-typical days; 37.1% of women and 44.2% of men.

The majority of students also reported a change in frequency and quantity, or both, on at least one of the 10 types of special occasions that occurred over a period (91.7%) and a change in their drinking quantity on at least one of the six types of individual special occasions (81.2%).

Drinking frequency

Based on participant's frequency of drinking on typical days only, 67.8% of male students and 64.2% of female students reported drinking on at least one day of the week. Only a small percentage reported drinking most days of the week (i.e. 5 days or more); 4.9% of men and 0.8% of women.

When non-typical days and special occasions were accounted for, the distribution shifted towards a higher frequency of consumption. Taking both typical and non-typical drinking days into account, 87.2% of respondents drank on one day a week or more. Men remained more likely to drink more often than women, 9.2% of men and 4.9% of women drank on five or more days of the week with 2.7% and 1.1%, respectively, reporting drinking every day. Adding in special occasion days, 89.6% of respondents had a weekly drinking frequency of one or more days a week; 8.6% of men had drank on five or more days compared to 3.1% of women, with 1.6% and 10.8%, respectively, reporting drinking every day.

Alcohol quantity

Mean consumption on typical days was 10.2 ± 2.1 units for male students and 7.6 ± 2.1 units for female students and ranged from 1.1-60.4 units for males and 0.9-51.3 units for females. On days when students reported drinking a 'bit more' average consumption increased to 17.3 ± 1.8 units and 11.6 ± 1.9 units, respectively. This ranged from 2.0-129.0 units for males and 1.1-80.0 units for females. Average consumption on days when respondents drank a 'lot more' was 24.7 ± 1.6 units for men and 16.7 ± 1.9 units for women and ranged from 5.2-73.9 units for males and 3.0-125.9 units for females. Average consumption on days when respondents drank 'less' were 4.0 ± 1.9 units and 2.8 ± 1.9 units, respectively, this ranged from 0.8-25.7 units for males and 0.6-16.0 units for females.

Weekly alcohol consumption

Mean weekly consumption on typical days only was 14.1 ± 4.2 units for male students and 7.5 ± 3.9 units for female students and ranged from 0.1-138.0 for males and 0.1-154.5 units for females. When non-typical day and special occasion days were also accounted for, mean weekly consumption increased to 21.5 ± 3.5 units for men and 11.4 ± 3.6 units for women. This represents an estimated increase in weekly units of 52.5% for men and 52.0% for women. Irrespective of age, the combined weekly estimate for students was 7.0% (men) and 20.0% (women) higher than the general population estimate. Comparing 18-21 year olds only (the 'typical' age range of UK university students), the general population combined

weekly unit intake estimate was 15.6 ± 17.02 in males, and 14.30 ± 12.60 in females, an increase of 37.8% for men but a decrease of -20.3% in women. These data suggest that the alternative method of estimating alcohol use captures more units in a student sample, and that there are sex differences when comparing these estimates with those derived from an aged matched general population sample, with male students typically reporting consuming more alcohol, and female students less.

Finally, respondents were categorised according to their reported weekly consumption across typical, non-typical and special occasions. Around half of female students were categorised as lower risk drinkers (52.8%; 0 to 14 units per week), but half of male students fell into the increasing/higher risk drinker category (50.0%; >21 units per week). This compares with 56.2% and 26.5% respectively of similarly aged respondents in the general population survey, suggesting that male students report increased alcohol related risk.

4.3.3 Hostel survey – summary of findings

Sample demographics

Interviews were completed with 200 respondents, aged between 17 and 78 years (mean age 35.7 ± 12.6 years) between June 2013 and February 2014. Two thirds were male (68.5%) and the majority described their ethnicity as White British (87.0%). A high proportion of respondents were unemployed or reported long-term sickness or disability (85.0%). A third of respondents had no formal qualifications (n=68, 34.0%), of those with qualifications, 18.5% had a GCSE equivalent qualification and 28% had a vocational qualification.

Interviews were conducted in at twelve services in three geographical areas; Leeds (31.0%), Liverpool (53.5%) and London (15.0%). Seven of the 12 services where the interviews were conducted were located in areas in the most deprived quintiles. Just under two thirds (62.5%) of respondents had stayed in a hostel and just under a third (35.0%) had slept rough in the last 12 months. Almost half of the respondents (48.5%) were currently living in a hostel at the time of interview, with 14.0% currently sleeping rough.

Alcohol consumption

The majority of respondents had drunk alcohol in the last year (89.5%; 92.0% of men and 84.1% of women). Of non-drinkers, 2.5% had never consumed alcohol and 8.0% had not drunk in the last 12 months. A higher percentage of women than men did not currently drink (15.9% vs. 8.0%). A number of participants reported periods of not

drinking within the last year due to spending time in alcohol treatment (8.5%) or prison (18.0%). A further 49.2% reported periods when they hadn't drunk any alcohol in the last year.

Drinking frequency

Based on typical days only, 79.9% of respondents drank on one day a week or more. Men reported drinking more often than women; 54.0% of men drank on 5 or more days compared to 47.2% of women, with 38.1% and 28.3%, respectively, reporting that they typically drink every day. Over half of drinkers (59.2%) reported having days when they drank more than their typical frequency and a quarter (25.7%) had days when they drank less. Reasons cited for changes in consumption included mood (either positive or negative), finances (i.e. having more or less money available) and family responsibilities (e.g. childcare). The most frequently reported reasons for drinking less than the typical amount included social occasions including watching sports, low mood, family responsibilities, reducing alcohol intake and financial reasons. Taking both typical and non-typical drinking days into account, frequency of drinking increased; 86.0% of respondents drank on one day a week or more, 58.0% of men and 47.2% of women drank on five or more days of the week with 43.4% and 54.0%, respectively, reporting drinking every day.

Alcohol quantity

Mean unit consumption on typical days was 17.0 ± 2.8 units for men and 16.3 ± 2.4 units for women, and ranged from 1.5-159.0 and 2.0-118.0 units respectively. Mean consumption on those days when respondents drank 'more' was 32.6 ± 2.3 units for men and 25.7 ± 2.2 units for women and ranged from 2.0-140.6 units and 3.0-144.5 units respectively. On days when respondents drank 'less' were 7.2 ± 2.4 units for men and 4.0 ± 2.0 units for women, and this ranged from 1.5-30.7 units and 1.5-17.3 units respectively.

Mean weekly consumption on typical days only was 30.6 ± 8.6 units for men and 27.5 ± 6.7 units for women, ranging from 0.04 – 761.4 and 0.04 – 298.2 units respectively. When typical and non-typical days were accounted for (unlike the household survey, 'special occasions' were not included in this survey), mean weekly consumption was $39.6 \text{ units} \pm 7.6$ (0.40 l/ethanol) for men and 30.6 ± 6.7 units (0.31 l/ethanol) for women. The respective unit ranges were 0.04 – 765.4 and 0.04 – 317.1.

The percentage increase in weekly consumption captured by the alternative methodology was 29.4% for men, and 19.1% for women. Compared with the

general population estimate (independent of age), the hostel sample reported consuming 97.1% (males) and 222.1% (females) more units per week.

Respondents were categorised according to their reported weekly consumption across typical and non-typical drinking. Considering typical weekly consumption alone, just over half of respondents were categorised as higher risk drinkers (over 50 units per week for a male and over 35 units per week for a female), 52.8% of women and 50.8% of men. With the addition of non-typical drinking days this increased to 54.7% of women and 54.0% of men categorised as higher risk drinkers.

Socioeconomic status and reporting

Frequency of drinking and weekly alcohol unit intake was reanalysed with respect to the SES (IMD quintile) of respondents. The survey enquired about postcode of residence; for those currently sleeping rough (14.0%), the postcode of the service they were attending was used. Over half (62.0%) of respondents resided in areas in the most deprived quintile 5 and reported the highest total mean weekly unit consumption, which was 42.5 units higher than the mean of other quintiles.

4.4 Discussion

Analyses of the three sets of survey data demonstrated the feasibility and utility of the expanded set of questions in capturing alcohol use in the previous year. By asking about non-typical and special occasions a greater frequency and quantity of alcohol consumption was captured. We estimated that this alternative means of assessing alcohol use captured an additional increase in population weekly alcohol unit consumption of approximately 25.1%, which may explain some of the discrepancy between known total alcohol sales and estimates from household surveys (see Section 1.3.1)⁶¹.

The adjusted estimate led to a greater proportion of the population being classified in increasing (16.6% → 21.7% for men; 13.3% → 18.7% for women) and higher risk (5.9% → 8.9%; 2.6% → 4.9%) alcohol use categories, and a corresponding decrease in the proportion of the population being classified as lower risk drinkers (77.5% → 69.4%; 84.1% → 76.3%). Of further interest, whilst there did not appear to be differences in underreporting on the basis of drinking risk alone, females typically underestimated consumption to a greater extent than males in all three risk categories (a difference 4.2; 13.4, and 15.5 percentage points in each increasing risk category). Although these changes were relatively modest, at a population level an increase in the proportion of higher risk drinkers has important implications

for policy monitoring, health service planning and estimating the burden of disease resulting from alcohol use⁵⁰.

Our initial analysis suggested that residents of more deprived IMD quintiles were more likely to report both last year drinking, and more frequent drinking. However, there was no pattern of association between quintiles when comparing the difference in alcohol use captured by the two different sets of questions. In keeping with the recent findings of Boniface and colleagues (2014) ⁶ who compared alcohol use estimates derived from the Health Survey for England (HSE) 2012 (data captured through computer assisted interview), with personal drink diaries, when we controlled for the influence of important additional variables, our analyses indicated that apart from sex, absolute changes in reporting of alcohol were unrelated to a number of sociodemographic factors, including IMD. However, heavier weekly alcohol use remained significantly associated with a greater discrepancy between the two drinking estimates, i.e. higher intake drinkers underreported alcohol use to a greater extent. Like Boniface and colleagues we note the discrepancy between our findings and those of Stockwell et al., (2014) who, using a different methodology (a modified quantity-frequency measure adjusted by sales data), reported that Canadian drinkers who underreported use were more likely to be younger and considered at lower risk.

The objective of the telephone survey was primarily to provide more accurate estimates of alcohol use, but a number of health and wellbeing questions were included to help explore the harm paradox. These included self-rated health, outpatient or casualty use in the previous 12 months, and in-patient hospital stays in the previous 12 month. We investigated whether there was an association between alcohol use and neighbourhood-level deprivation on these health related outcomes. Somewhat unexpectedly, univariate analysis suggested that living in the least deprived quintiles (Quintile 1 and 2) was associated with lower self-reported health than the most deprived respondents. There was no association between IMD and self-reported healthcare use. Previous research has tended to the conclusion that deprivation is associated with relatively poorer health ^{10, 11}, possibly as a result of psychosocial and material factors⁶²⁻⁶⁴, hence it was predicted that living in more deprived IMD would be associated with poorer health. Extending the analysis, it was clear that the relationship of IMD with health was confounded by level of personal alcohol risk, as once the effects of weekly unit consumption and drinking frequency were accounted for in the analysis there was no longer a significant relationship between area deprivation and health. Furthermore, after controlling for the effects of IMD, increasing and higher risk category drinkers were more likely to

report poorer health, and more likely to report healthcare usage in the previous 12 months than lower risk drinkers. These findings were robust and remained after controlling for a number of important individual factors which could have partly explained the relationship such as age, sex, smoking, ethnicity, fruit and vegetable consumption, exercise, life satisfaction, employment and education. Although our data were self-reported, they correspond with analyses of English hospital admission data reported in Section 1.2⁶⁵ which have also shown a socio-economic gradient, but which did not control for potential confounding.

In summary, it is possible to conclude from this data that the alcohol harm paradox is not a result of differential under-reporting between different SES groups, that heavier drinkers are more likely to underestimate consumption, and that underreporting is not a result of the interaction between drinking patterns and deprivation (hypotheses 1 and 2, Section 1.3).

The data collected from two populations underrepresented in national estimates (University students and hostel service users) showed a higher weekly consumption amongst these groups compared to the general population survey. These exercises were not intended to provide generalisable estimates of alcohol use in these populations, or to provide directly comparable data to the telephone survey, but serve to demonstrate the utility of the questionnaire to prompt more accurate recall in a range of different groups, even those respondents (i.e. hostel users) who may potentially report a very high consumption of alcohol (total weekly units in our hostel study ranged from 0.04-765.35). There was a large difference in weekly unit reporting in the hostel sample compared with the general population telephone survey; males reported consuming almost twice as many units, and females over three times as many weekly units as the general population mean. This is likely to be an underestimate as this sample was not asked about special occasions because the previous year was interrupted by events such as prison incarceration, rough sleeping/homelessness, and alcohol treatment episodes. There is limited other UK data on alcohol use in this population; one earlier analysis of the 1994 Adult Psychiatric Morbidity Survey estimated that homeless individuals in Great Britain (i.e. excluding Northern Ireland) consume a mean of 23.8 l/ethanol per annum (based on estimates from the), compared with 7.04 l/ethanol in the general population, an increase of 238.1%⁵. This was similar to the estimates derived from our study (males consumed a mean of 20.8 l/ethanol, and females 16.1 l/ethanol per annum). Overall, and taking into account the numbers of people affected by homelessness, such individuals were estimated in this earlier study to contribute an additional 0.08 l/ethanol per capita to national estimates based on the GHS 2006 (compared with

+0.03 l/ethanol for students). Notwithstanding differences in definition of 'homelessness'⁶⁶ between different surveys (e.g. sleeping rough, in temporary accommodation, 'sofa surfing'), it is clear that such under- and unsampled populations make small, but important contributions to estimates of total population alcohol use. However, we acknowledge that because of adaptations made to the questionnaire used with the participants in the hostel survey, this data is not directly comparable with that collected in the national survey. Further analyses are required to explore how the data collected from underrepresented populations can be used to inform the analyses of the data collected in the national survey.

It is important to briefly describe some of the strengths and weaknesses of the current study. We undertook a large representative telephone survey of adults in England, and we are confident that this provided more accurate estimates of alcohol use than previous household studies without the need for complex data calibration. The survey also included a number of distal and proximal variables which enabled the exploration of alcohol use on the basis of a wide range of individual, community and structural risk factors. The incorporation of a number of additional variables allows further exploration of the association between alcohol use and health and social related outcomes. The rich dataset collected will allow for further exploration of alcohol use and patterns of drinking on the basis of beverage choice, changes in patterns of use, and drinking histories (e.g. initiation and length of alcohol use career).

This was a cross-sectional study, and although weighted to improve representativeness, suffers from some of the same weaknesses of similar approaches to assessing health behaviours. Firstly, the survey depended on remembering alcohol use over an extended period of time or on particular special occasions, and recall bias might vary as a function of demographic factors and time elapsed since the event in question (e.g.⁶⁷). For example, respondents who answered the survey shortly after the Christmas period would be more likely to recall alcohol use for this special occasion than those recalling later in the year. Although our survey was weighted to be representative of the English population, we recognise that there may be important differences in alcohol use between landline and mobile telephone users, and those who respond to unsolicited calls ('call screening'). Furthermore, response rate between the two modalities differed, and as we found in the current research, it was generally low regardless of method used (9.2% landline, 6.8% mobile). This rate is in keeping with findings of other research, which has suggested that with the growing rise in mobile phone use,

participation rates in landline telephone surveys have fallen. One recent estimate from the USA suggested that response rate for telephone surveys fell from 28% in 2000 to 9% in 2012⁶⁸, which closely matched our own response rate. We did not have access to demographic data on survey refusers, therefore it was not possible to estimate whether non-response was related to the survey topic, or demographic or other unmeasured factors. In our analysis we only explored under-reporting by a limited number of categories such as deprivation and current drinking risk categories, but it is likely that the distribution of under-reporting might vary by other unmeasured factors, which may also mediate the associations that we found; hence our analysis cannot be considered exhaustive.

Specific weaknesses of the student and hostel survey relate to the representativeness of the sample, meaning that although they provide useful data, the derived estimates cannot be generalised to the wider population. Recall bias was also likely to be an important limitation of the hostel survey because of the large range of alcohol use reported (e.g. weekly unit range estimate in men was 0.04 – 761.4), and the interruption of usual activities through significant life events (e.g. prison, alcohol treatment, rough sleeping).

4.5 Tables

Table 4.4-1a. National Survey unweighted sample characteristics

	Unweighted n (%)					
	Male		Women		Total	
Total	2,161	(35.5)	3,928	(64.5)	6,089	(100.0)
Mean age (SD)	56.6	(17.5)	57.0	(17.0)	56.8	(17.2)
Age group						
16-24 yrs	134	(6.2)	176	(4.5)	310	(5.1)
25-44 yrs	379	(17.5)	754	(19.2)	1,133	(18.6)
45-64 yrs	830	(38.4)	1,510	(38.4)	2,340	(38.4)
65 yrs and over	818	(37.9)	1,488	(37.9)	2,306	(37.9)
Ethnic group						
White British	1,879	(87.0)	3,495	(89.0)	5,374	(88.3)
White Irish or White Other	108	(5.0)	182	(4.6)	290	(4.8)
Mixed	24	(1.1)	40	(1.0)	64	(1.1)
Asian or Asian British	77	(3.6)	114	(2.9)	191	(3.1)
Black or Black British	38	(1.8)	55	(1.4)	93	(1.5)
Other	21	(1.0)	27	(0.7)	48	(0.8)
Prefer not to say/Missing	14	(0.6)	15	(0.4)	29	(0.4)
Marital Status						
Married or civil partnership	1,188	(55.0)	1,979	(50.4)	3,167	(52.0)
Partner or co-habiting	227	(10.5)	358	(9.1)	585	(9.6)
Widowed	167	(7.7)	674	(17.2)	841	(13.8)
Separated	23	(1.1)	53	(1.3)	76	(1.2)
Divorced	114	(5.3)	297	(7.6)	411	(6.7)
Single	438	(20.3)	554	(14.1)	992	(16.3)
Missing	4	(0.2)	13	(0.3)	17	(0.3)
Educational attainment						
Higher degree (Masters/PhD)	246	(11.4)	339	(8.6)	585	(9.6)
Bachelor degree	491	(22.7)	876	(22.3)	1,367	(22.5)
A Level	306	(14.2)	544	(13.8)	850	(14.0)
Vocational qualifications	254	(11.8)	330	(8.4)	584	(9.6)
GCSE/O Level/CSE	255	(11.8)	620	(15.8)	875	(14.4)
Other	240	(11.1)	386	(9.8)	626	(10.3)
No formal qualifications	332	(15.4)	778	(19.8)	1,110	(18.2)
Still studying	23	(1.1)	20	(0.5)	43	(0.7)
Don't know/Missing	14	(0.6)	35	(0.9)	49	(0.8)
Working status						
Full time employed	661	(30.7)	688	(17.6)	1,349	(22.3)
Part time employed	90	(4.2)	637	(16.3)	727	(12.0)
Self employed	190	(8.8)	179	(4.6)	369	(6.1)
Unemployed	145	(6.7)	151	(3.9)	296	(4.9)
Student	80	(3.7)	143	(3.7)	223	(3.7)
Long-term sick or disabled	62	(2.9)	81	(2.1)	143	(2.4)
Retired or semi-retired	904	(42.0)	1,777	(45.5)	2,681	(44.3)
House wife/husband	6	(0.3)	197	(5.0)	203	(3.4)
Other	12	(0.6)	32	(0.8)	44	(0.7)
Missing	2	(0.1)	17	(0.4)	19	(0.3)
IMD 2010 deprivation quintile						
1 Least deprived	481	(22.3)	944	(24.0)	1,425	(23.4)

2	469	(21.7)	915	(23.3)	1,384	(22.7)
3	484	(22.4)	800	(20.4)	1,284	(21.1)
4	370	(17.1)	713	(18.2)	1,083	(17.8)
5 Most deprived	357	(16.5)	556	(14.2)	913	(15.0)

Table 4.1b Weighted population estimates

	Weighted estimate (%)	
	Male	Female
Total	48.7	51.3
Mean age (SD)		
Age group		
16-25	17.3	14.7
26-35	16.0	17.1
36-45	16.1	18.6
46-55	18.1	16.3
56-65	14.5	14.7
66-75	11.4	11.4
76-85	5.7	5.9
>85	0.9	1.3
Ethnic group		
White British	80.0	83.3
White Irish or White Other	6.2	4.8
Mixed	2.2	2.0
Asian or Asian British	6.5	5.6
Black or Black British	3.0	2.7
Other	1.6	1.2
Prefer not to say/Missing	0.5	0.5
Marital Status		
Married or civil partnership	46.9	47.2
Partner or co-habiting	14.6	13.6
Widowed	4.1	9.3
Separated	0.7	1.5
Divorced	4.1	5.4
Single	29.4	22.7
Missing	0.2	0.3
Educational attainment		
Higher degree (Masters/PhD)	12.0	10.2
Bachelor degree	24.2	26.0
A Level	19.7	18.2
Vocational qualifications	10.9	8.3

GCSE/O Level/CSE	11.8	14.8
Other	8.1	8.4
No formal qualifications	10.0	12.3
Still studying	2.6	1.2
Don't know/Missing	0.1	0.2
Working status		
Full time employed	42.5	26.7
Part time employed	5.5	22.0
Self employed	10.8	5.6
Unemployed	9.2	5.2
Student	8.2	8.4
Long-term sick or disabled	2.4	1.8
Retired or semi-retired	20.1	22.2
House wife/husband	0.2	6.3
Other	1.1	1.2
Missing	0.1	0.6
IMD 2010 deprivation quintile		
1 Least deprived	21.0	19.0
2	19.9	20.1
3	20.9	19.2
4	19.3	20.6
5 Most deprived	18.8	21.1

Table 4.2 Drinking status by age and sex

	Non drinker		Not drank in last year		Current drinker	
	Male/Female	Total	Male/Female	Total	Male/Female	Total
16-25	11.8/14.6	13.1	8.2/8.2	8.2	80.1/77.2	78.7
26-35	8.6/7.2	7.8	10.7/13.2	12.0	80.7/79.6	80.1
36-45	9.3/7.0	8.0	16.3/16.5	16.4	74.4/76.5	75.5
46-55	5.9/5.6	5.8	12.1/16.6	14.3	82.0/77.8	80.0
56-65	3.3/4.4	3.9	16.7/19.0	17.9	79.9/76.6	78.2
66-75	2.6/4.8	3.7	16.7/25.2	21.1	80.7/70.0	75.2
76-85	4.6/12.1	8.5	23.7/30.2	27.1	71.7/57.6	64.4
>85	11.3/15.5	13.8	30.6/37.8	34.9	58.1/46.7	51.3
Total	7.1/7.7	7.4	13.9/17.2	15.6	79.0/75.1	77.0

Table 4.3 Analysis of drinking behaviour by socioeconomic status. Unless stated data are %

	IMD quintile				
	1 Least deprived	2	3	4	5 Most deprived
Drinking status					
Non drinker	13.0	8.3	5.8	5.2	4.8
Not drank in last year	19.1	19.0	15.5	13.1	11.2
Current drinker	67.9	72.7	78.7	81.7	84.0
Typical frequency of use (%)					
Every day	2.9	4.7	4.3	5.1	5.2
5-6 days/week	3.5	1.9	2.7	4.4	5.1
3-4 days/week	9.6	6.8	13.7	13.4	15.5
1-2 days/week	20.9	23.2	26.8	26.8	27.6
2-3 days/month	9.6	9.6	9.1	9.3	11.9
1 day/month	6.8	7.8	8.6	7.4	5.8
Less often	18.4	18.7	13.5	15.3	12.9
Non drinker	13.0	8.3	5.8	5.2	4.8
Not drank in last year	19.1	19.0	15.5	13.1	11.2
Typical mean units/week (male/female)	11.9 ± 21.8 (16.2 ± 26.9/ 7.3 ± 13.2)	12.9 ± 41.3 (19.7 ± 56.6/ 6.1 ± 11.2)	11.6 ± 19.1 (16.2 ± 24.2/ 6.8 ± 9.6)	10.5 ± 24.7 (14.4 ± 33.4/ 6.7 ± 9.5)	10.9 ± 15.4 (14.3 ± 18.8/ 7.8 ± 10.5)
Combined (typical, non-typical, special occasion) estimate mean units/week (male/female)	14.4 ± 22.6 (19.2 ± 27.8/ 9.3 ± 13.8)	16.9 ± 54.7 (25.1 ± 75.3/ 8.8 ± 14.2)	15.3 ± 21.7 (20.6 ± 26.7/ 9.8 ± 12.8)	13.6 ± 26.9 (18.1 ± 35.9/ 9.2 ± 11.7)	14.0 ± 17.7 (18.1 ± 20.7/ 10.2 ± 13.2)
% mean change (male/female)	21.0	31.0	31.9	29.5	28.4
Total frequency of use					
Every day	2.9	5.1	6.1	6.1	5.9
5-6 days/week	5.3	4.5	7.0	8.3	10.0
3-4 days/week	12.8	15.3	20.9	21.1	22.7
1-2 days/week	22.2	23.4	25.1	24.2	26.0
2-3	10.1	10.3	8.9	10.6	9.7

days/month					
1 day/month	3.9	6.3	3.8	4.1	4.0
Less often	10.8	7.8	6.8	7.2	5.7
Non drinker	13.0	8.3	5.8	5.2	4.8
Not drank in last year	19.1	19.0	15.5	13.1	11.2
Total mean units/week	14.4 ± 22.6	16.9 ± 54.7	15.3 ± 21.7	13.6 ± 26.9	14.0 ± 17.7
Drinking risk classification (typical)					
Non-drinker	32.1	27.3	21.3	18.3	16.0
lower	54.0	60.4	63.0	67.4	66.3
Increasing	9.6	8.6	12.0	12.4	14.9
Higher	4.3	3.7	3.6	1.9	2.9
Drinking risk classification (total)					
Non-drinker	32.1	27.3	21.3	18.3	16.0
lower	50.8	54.1	57.0	60.1	58.4
Increasing	12.3	12.1	15.1	17.6	20.7
Higher	4.8	6.5	6.5	3.8	5.0

Table 4.4a. Odds ratio (±95%CI) of reporting in excess of recommended thresholds. Comparison between typical and combined drinking estimates. † Reference category; * p < 0.05; ** p < 0.01; * p < 0.001**

	Drinking in excess of threshold – typical drinking	Drinking in excess of threshold – combined drinking estimate (typical, non-typical and special occasions)
	AOR (95% CI)	
Age (1 year increase)	1.01 (1.00-1.01)**	0.99 (0.99-1.00)
Sex		
Female†	-	-
Male	1.52 (1.31-1.77)***	1.42 (1.25-1.62)***
Deprivation quintile		
5 (most deprived) †	-	-
Quintile 4	0.78 (0.62-0.98)*	0.81 (0.66-0.98)*
Quintile 3	0.92 (0.74-1.15)	0.93 (0.68-1.01)

Quintile 2	0.76 (0.60-0.96)*	0.77 (0.63-0.94)*
1 (least deprived)	0.98 (0.78-1.23)	0.74 (0.60-0.91)**
Government office region		
East Midlands	0.72 (0.54-0.96)*	0.68 (0.53-0.88)**
East of England	0.55 (0.39-0.77)**	0.48 (0.35-0.64)***
London	0.53 (0.38-0.73)***	0.48 (0.36-0.64)***
North East	0.62 (0.46-0.83)**	0.61 (0.47-0.80)***
North West	1.04 (0.72-1.49)	0.87 (0.63-1.22)
South East	0.83 (0.64-1.09)	0.75 (0.59-0.96)*
South West	0.70 (0.52-0.95)*	0.65 (0.49-0.85)**
West Midlands	0.52 (0.38-0.72)***	0.63 (0.47-0.83)**
Yorkshire and the Humber	-	-

Table 4.4b Odds ratio ($\pm 95\%CI$) of drinking classification (typical consumption); comparison against most deprived quintile

	Quintile 5 (most deprived)		
	Lower	Increasing	Higher
Quintile 1 (least deprived)	1.04 (0.83 – 1.31)	0.78 (0.60 – 0.99)*	1.89 (1.22 – 2.94)**
Quintile 2	1.30 (1.03 – 1.64)*	0.63 (0.48 – 0.81)***	1.55 (0.99 – 2.42)*
Quintile 3	1.08(0.86 – 1.34)	0.81 (0.64 – 1.02)*	1.36 (0.86 – 2.14)
Quintile 4	1.26 (1.01 – 1.58)*	0.83 (0.66 – 1.05)	0.67 (0.39 – 1.14)

Table 4.4c. Odds ratio ($\pm 95\%CI$) of drinking classification (total consumption); comparison against most deprived quintile. * $p < 0.05$; ** $p < 0.01$; * $p < 0.001$**

	Quintile 5 (most deprived)		
	Lower	Increasing	Higher
Quintile 1 (least deprived)	1.31 (1.07 – 1.61)**	0.68 (0.54 – 0.85)***	1.21 (0.84 – 1.75)
Quintile 2	1.28 (1.05 – 1.56)**	0.61 (0.49 – 0.77)***	1.54 (1.09 – 2.18)**
Quintile 3	1.16 (0.95 – 1.41)	0.73 (0.59 – 0.90)**	1.44 (1.00 – 1.05)*
Quintile 4	1.23 (1.01 – 1.49)*	0.84 (0.68 – 1.03)	0.76 (0.52 – 1.13)

Table 4.5 Alcohol risk amongst last year drinkers, binary regression analyses. †
Reference category; * p < 0.05; ** p < 0.01; * p < 0.001**

	Increasing risk drinkers	Higher risk drinkers	Drinking has caused a serious problem
	AOR (95% CI)		
Sex			
Female†	-	-	-
Male	1.16 (0.99-1.35)	1.57 (1.22-2.03)***	1.61 (1.20-2.15)**
Age			
16-30†	-	-	-
31-45	0.72 (0.58-0.90)**	1.50 (1.08-2.08)*	1.99 (1.35-2.99)***
46-60	1.14 (0.92-1.42)	1.60 (1.15-2.22)**	1.58 (1.10-2.27)*
61-75	0.77 (0.55-1.06)	1.59 (0.96-2.65)	3.95 (2.01-7.77)***
>75	0.44 (0.26-0.73)**	4.30 (1.64-11.26)	11.40 (3.29-39.49)
Ethnicity			
White British†	-	-	-
White other	1.09 (0.80-1.49)	0.50 (0.26-0.99)*	0.89 (0.46-1.70)
Asian or Asian British	0.41 (0.21-0.82)*	1.06 (0.52-2.16)	0.26 (0.07-1.02)
Other	1.39 (1.01-1.91)*	0.68 (0.37-1.24)	0.66 (0.35-1.25)
Employment status			
Full time employed† or self employed	-	-	-
Part time employed	0.68 (0.54-0.86)**	1.14 (0.78-1.66)	0.60 (0.34-1.05)
Unemployed	0.51 (0.35-0.72)***	2.32 (1.62-3.30)***	3.16 (2.16-4.63)***
Students	0.43 (0.29-0.65)***	0.15 (0.05-0.48)**	0.14 (0.04-0.57)**
Retired	0.87 (0.63-1.20)	0.90 (0.52-1.55)	1.45 (0.74-2.84)
Other	0.86 (0.66-1.10)	0.63 (0.39-0.99)*	1.22 (0.80-1.87)
Deprivation quintile			
1 (least deprived) †	-	-	-
Quintile 2	0.94 (0.72-1.22)	1.53 (1.05-2.24)*	1.11 (0.73-1.74)
Quintile 3	1.16 (0.90-1.50)	1.59 (1.09-2.32)*	1.55 (1.02-2.34)*
Quintile 4	1.34 (1.04-1.72)*	1.08 (0.71-1.65)	1.18 (0.74-1.86)

5 (most deprived)	1.62 (1.27-2.07)**	1.26 (0.85-1.88)	0.67 (0.41-1.10)
Health rating			
Very good [†]	-	-	-
Good	1.02 (0.86-1.21)	1.24 (0.92-1.68)	1.68 (1.13-2.50)*
Fair	0.84 (0.64-1.19)	1.53 (1.02-2.31)*	3.72 (2.32-5.96)***
Bad	0.61 (0.35-1.07)	2.13 (1.15-3.93)*	5.60 (2.96-10.60)***
Very bad	1.24 (0.54-2.85)	1.99 (0.75-5.27)	6.82 (2.65-17.55)***
Life satisfaction			
Very satisfied [†]	-	-	-
Satisfied	1.31 (1.11-1.54)**	1.42 (1.05-1.92)*	1.41 (0.98-2.04)
Neither satisfied/dissatisfied	0.90 (0.67-1.19)	2.56 (1.76-3.73)***	2.26 (1.45-3.51)***
Dissatisfied	1.05 (0.63-1.76)	2.58 (1.39-4.78)**	1.04 (0.47-2.32)
Very dissatisfied	1.30 (0.69-2.46)	4.60 (2.46-8.61)***	6.87 (3.60-13.12)
Smoking status			
Never smoked [†]	-	-	-
Current smoker	1.77 (1.44-2.17)***	2.70 (1.98-3.67)***	2.88 (2.04-4.09)***
Former smoker	1.46 (1.23-1.74)***	1.90 (1.40-2.57)***	1.68 (1.17-2.43)**
BMI	0.98 (0.96-0.99)*	1.01 (0.99-1.04)	0.99 (0.97-1.02)

Table 4.6 Self-reported health indicators amongst last year drinkers, binary regression analyses. † Reference category; * p < 0.05; ** p < 0.01; * p < 0.001. NB Number of days a week spent exercising was included in the model but because all participants reported either no exercise or 1-4 days, this wasn't retained.**

	Self-rated health			Attended outpatient or casualty in last 12 months			Inpatient hospital stay in the last 12 months		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	OR (95% CI)	AOR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	AOR (95% CI)
Deprivation quintile									
1 (least deprived)	0.38 (0.23-0.61)***	0.38 (0.23-0.62)***	0.42 (0.25-0.69)*	1.19 (0.92-1.54)	1.18 (0.91-1.53)	1.08 (0.73-1.41)	0.91 (0.66-1.25)	0.90 (0.65-1.24)	0.92 (0.66-1.28)
Quintile 2	0.59 (0.35-0.99)*	0.62 (0.37-1.04)	0.69 (0.41-1.18)	1.25 (0.97-1.60)	1.22 (0.95-1.57)	1.16 (0.90-1.50)	1.09 (0.80-1.47)	1.06 (0.78-1.44)	1.05 (0.77-1.42)
Quintile 3	1.03 (0.58-1.82)	1.07 (0.60-1.89)	1.07 (0.60-1.91)	1.25 (0.98-1.60)	1.23 (0.96-1.58)	1.20 (0.93-1.54)	0.83 (0.61-1.14)	0.82 (0.60-1.12)	0.84 (0.61-1.16)
Quintile 4	0.96 (0.55-1.68)	0.95 (0.54-1.66)	1.06 (0.60-1.86)	0.85 (0.65-1.10)	0.86 (0.66-1.12)	0.82 (0.65-1.11)	0.99 (0.73-1.33)	0.99 (0.73-1.33)	0.96 (0.71-1.29)
5 (most deprived) †	-	-	-	-	-	-	-	-	-
Drinking risk category									
Lower risk	-	2.44 (1.55-3.83)***	2.08 (1.28-3.39)**	-	0.53 (0.41-0.70)***	0.62 (0.47-0.83)**	-	0.78 (0.54-1.11)	0.79 (0.55-1.15)
Increasing risk	-	2.89 (1.63-5.13)***	3.14 (1.71-5.76)***	-	0.52 (0.38-0.72)**	0.59 (0.42-0.81)**	-	0.64 (0.42-0.97)*	0.65 (0.43-1.00)
Higher risk†	-	-	-	-	-	-	-	-	-
Total drinking days per week	-	0.96	1.08	-	0.96	0.97	-	1.07*	1.00
Sex									
Female†	-	-	-	-	-	-	-	-	-
Male	-	-	0.45 (0.32-0.64)***	-	-	1.21 (1.03-1.43)*	-	-	1.07 (0.87-1.31)
Age									

16-24†	-	-	-	-	-	-	-	-	-
25-44	-	-	0.43 (0.20- 0.92)*	-	-	0.76 (0.59- 0.97)*	-	-	1.75 (1.15- 2.66)**
45-64	-	-	0.13 (0.06- 0.26)***	-	-	0.68 (0.53- 0.88)**	-	-	3.00 (2.01- 4.49)***
>65	-	-	0.26 (0.12- 0.55)***	-	-	0.80 (0.60- 1.06)	-	-	3.49 (2.28- 5.35)***
Ethnicity									
White British†	-	-	-	-	-	-	-	-	-
White other	-	-	1.57 (0.65- 3.81)	-	-	0.75 (0.51- 1.11)	-	-	0.69 (0.42- 1.14)
Asian or Asian British	-	-	4.04 (0.37- 44.27)	-	-	0.65 (0.34- 1.25)	-	-	0.33 (0.09- 1.14)
Other	-	-	1.43 (0.62- 3.27)	-	-	1.30 (0.93- 1.81)	-	-	0.85 (0.51- 1.41)
Current smoker									
No†	-	-	-	-	-	-	-	-	-
Yes	-	-	0.44 (0.31- 0.64)***	-	-	1.32 (1.08- 1.61)**	-	-	1.41 (1.09- 1.82)**
Employment status									
Unemployed†	-	-	-	-	-	-	-	-	-
In employment (full or part time)	-	-	2.73 (1.53- 4.87)**	-	-	0.73 (0.54- 1.00)	-	-	0.59 (0.40- 0.88)*
Economically inactive	-	-	0.68 (0.38- 1.22)	-	-	0.78 (0.56- 1.09)	-	-	0.79 (0.52- 1.21)
Life satisfaction									
Very dissatisfied†	-	-	-	-	-	-	-	-	-
Dissatisfied	-	-	1.36 (0.64- 2.88)	-	-	0.45 (0.23- 0.87)*	-	-	0.98 (0.47- 2.05_
Neither satisfied/dissatisfied	-	-	6.04 (3.04- 12.00)***	-	-	0.43 (0.25- 0.72)**	-	-	0.75 (0.40- 1.39)

Satisfied	-	-	19.029 (9.53- 38.02)***	-	-	0.30 (0.18- 0.49)***	-	-	0.43 (0.23- 0.78)**
Very satisfied	-	-	24.79 (11.84- 51.88)***	-	-	0.27 (0.16- 0.45)***	-	-	0.45 (0.24- 0.82)*
Fruit and vegetable consumption (portions/day)									
0-1†	-	-	-	-	-	-	-	-	-
1 to <3	-	-	0.98 (0.45- 2.10)	-	-	0.50 (0.33- 0.76)**	-	-	0.87 (0.52- 1.48)
3 to <5	-	-	1.04 (0.48- 2.24)	-	-	0.44 (0.29- 0.65)***	-	-	0.66 (0.40- 1.12)
5 to <7	-	-	0.71 (0.33- 1.53)	-	-	0.52 (0.35- 0.78)**	-	-	0.76 (0.45- 1.29)
7+	-	-	1.23 (0.43- 3.48)	-	-	0.49 (0.30- 0.79)**	-	-	0.86 (0.46- 1.58)

5 WORK STREAM 4: SYNTHESIS OF FINDINGS

This final work stream synthesises findings across work streams into one overarching analysis in order to test some of the hypotheses presented to explain the alcohol harm paradox.

We developed five research hypotheses (see Section 1.3) that might underpin the alcohol harm paradox (others may also be important), although in the current work we only directly tested hypotheses 1 to 3:

1. **Under-reporting** or inaccurate reporting in low SES groups, or by heavy drinkers in low SES groups, compared to less deprived groups;
2. Differences in **drinking patterns** between SES groups rather than differences in intake (e.g. 'bingeing' and heavy episodic use; drink-type preference)
3. **Compounding** due to clustering of unhealthy behaviours and associated risk factors in more deprived neighbourhoods.
4. Differential access to, and quality of, **health services** and other neighbourhood resources such as alcohol outlets.
5. The **poverty gradient** through which unhealthy heavy drinkers moving into poverty through loss of employment opportunities.

5.1 Summary of evidence in support of the research hypotheses

- **There is good evidence that people in low SES show a greater susceptibility to the harmful effects of alcohol, but a lack of published evidence means that it is not possible to conclude what mechanisms and pathways might underlie this difference in risk.**

In Work Stream 1 we undertook systematic literature reviews to i) investigate the relationship between SES and risk of mortality or morbidity for a range of alcohol-attributable conditions; and to ii) to explore alcohol consumption as a mediating variable in this relationship; and iii) to review evidence that would support the calculation of Alcohol Attributable Fractions for specific drinking patterns and SES.

With respect to alcohol related disease we identified differing relationships between a range of alcohol-attributable conditions and socioeconomic status. We concluded that relative to high SES, low SES was associated with an increased risk of head and neck cancers, strokes, hypertension, liver disease and pre-term birth. These findings were independent of a number of other known risk factors for the

conditions such as diet and smoking, and other potential confounding factors. Due to a lack of published data, we were unable to undertake a meta-analysis to generate pooled estimates (relative risk; RR) of the change in risk of alcohol consumption between participants with different SES. Therefore we were unable to fully quantify the interaction between alcohol use and SES in the risk of alcohol-attributable disease. It was unclear whether the lack of evidence on this topic was a result of publication bias against negative findings, thus suggesting a lack of association, or whether the work had simply not been conducted. Regardless, differences in primary study definitions of SES and the indicators used to measure it (e.g. neighbourhood level vs individual level), and the failure of most authors to include alcohol use as an independent variable in analyses rather than as a broad confounder, meant that we were unable to resolve the question about whether the alcohol harm paradox is due to differences in patterns of drinking, the types of beverage consumed, or other alcohol related behaviours.

We also undertook a systematic review and meta-analysis in order to examine alcohol related deaths and hospital admissions. Across both studies it was clear that both men and women of low SES have a higher risk of death or hospitalisation from alcohol-related causes than those of high SES. These findings were robust across three measures of SES, occupational social class, education and income. The pooled RR for the association between low occupational social class and alcohol-related death or hospitalisation ranged from 0.32 to 15.03 across studies. Individuals of low occupational social class had an overall RR for alcohol-related death or hospitalisation of 1.81 compared with individuals of higher occupational social class (i.e. almost twice as likely to be at risk of alcohol related death), and there were differences between sexes (pooled RR for men = 2.42 vs pooled RR for women = 1.27). Looking at SES on the basis of education, compared to those with a high level of education, women with a lower level of education had a higher risk of alcohol-related death or hospitalisation (pooled RR 2.43) than men (pooled RR 1.62).

In summary, whilst acknowledging the lack of available evidence, the findings of the Work Stream provided further evidence that people in low SES show a greater susceptibility to the harmful effects of alcohol (at least for those conditions studied), but the work did not reveal what mechanisms and pathways might underlie this difference in risk.

- **Analysis of existing household survey data suggested that different SES groups do not differ in the amount and frequency of alcohol drunk across the week, but there were important differences in ‘binge drinking’, beverage choice, and patterns of heavy drinking. This association remained after controlling for a number of important confounding factors.**
- **Analysis of existing household survey data did not suggest a link between SES and self-reported health related outcomes of alcohol use after controlling for important confounding factors. It is unknown whether there are links between deprivation, alcohol and health outcome data collected by formal monitoring systems such as hospitals.**

In Work Stream 2 we undertook a secondary analysis of the GLF, which our mapping review concluded was the most useful existing household survey with which to explore the paradox. Unfortunately, due to limitations/restrictions with the secure data analysis platform provided by the data gatekeepers we were unable to link the GLF to data on neighbourhood level mortality and morbidity held elsewhere, which severely restricted opportunities for analysis of the outcomes of drinking.

There was no apparent relationship between individual or neighbourhood level SES (e.g. employment, income, education, and occupation) and weekly drinking risk (defined on the basis of the number of units consumed). However, when considering patterns of alcohol use, increased neighbourhood deprivation, and lower individual SES were both associated with regular ‘binge drinking’, and these findings were independent of a range of confounding factors. Looking at heavier drinkers only (defined as males drinking >75 units/week and women >50 units/week), this was largely dependent on highest educational achievement, with respondents who had not achieved a degree or diploma significantly more likely to be classified as the heaviest drinker. Neighbourhood level deprivation was also important, but it was not possible to separate this from the effects of other individual level SES variables. There were also differences in beverage choice on the basis of individual level SES, and regular binge drinking was associated with use of beer, which was the preferred drink of individuals in lower SES. In contrast, a preference for wine, which was associated with higher individual SES, significantly predicted exceeding weekly drinking guidelines. Understanding beverage choice is important because previous research has suggested a link between certain drinks and harmful outcomes (e.g. spirits and liver cirrhosis) ^{52,53}, and behavioural experiments have suggested that there are differences between drinks with respect

to the amount of alcohol poured at home, which means that unit estimates derived from consumption of some drinks (e.g. sprits) are likely to be an underestimate⁶⁹.

Finally, the analysis was extended to include a consideration of the outcomes of drinking, although only self-reported measures were available (self-reported health, and recent health service use). We found that there was no relationship between increasing deprivation or lower individual level SES and these health outcomes.

In summary, and in support of hypothesis 2 (drinking patterns), people in lower SES groups consumed similar amounts of alcohol but reported different beverage preferences, and different drinking patterns (bingeing). A lack of robust health data linkage meant that we were unable to relate these differences to meaningful health outcomes.

- **Although there is underreporting in general population alcohol surveys, this does not seem to differ by SES.**
- **There is differential underreporting on the basis of alcohol risk, with higher risk drinkers underreporting to a greater extent than lower risk drinkers.**
- **The use of adjusted estimates of general population alcohol use is likely to lead to more people being classified as at increasing and higher risk from their alcohol use.**
- **The survey did not suggest a link between SES and self-reported health related outcomes of alcohol use after controlling for important confounding factors such as diet, smoking, and exercise. However, alcohol risk classification was important in this regard. It remains uncertain whether there are links between deprivation, our revised estimate of alcohol use and health related outcomes collected by formal monitoring systems such as hospitals.**
- **Resilience factors such as good diet, exercise and greater life satisfaction do not appear to influence the relationship between alcohol, SES and health outcomes.**
- **It is possible to more accurately estimate alcohol use in underrepresented groups such as those at risk from homelessness and students. Including populations such as hostel users will increase per capita alcohol estimates, but there may be sex differences in students.**

Hypothesis 1 stated that the alcohol harm paradox is not robust and is a result of differential underreporting between SES groups and the interaction with level of alcohol risk. In other words, the hypothesis states that previous data purporting links between lower SES and harmful alcohol outcomes, despite similarities in

consumption with more affluent groups, were simply a result of more deprived groups being less accurate in reporting alcohol use. In reality, the hypothesis states, lower SES groups drink more, and it is this that is responsible for harm, and not other more complex social factors interacting with level of deprivation.

In Work Stream 3 we therefore developed a new way of asking about alcohol to examine whether we could capture more use, and if this change was related to SES or different types of alcohol use behaviour. We conducted a random dial telephone survey in England, and weighted our data to ensure it was representative of the national population.

In summary, by including questions asking about special occasions (e.g. holidays, Christmas celebrations) and days where the respondent may have drunk more or less than usual we estimated that we captured an additional 25.1% more weekly alcohol units. This has implications for national estimates of alcohol risk, as we found a higher proportion of the population being classed as increasing (16.6% → 21.7% for men; 13.3% → 18.7% for women) and higher risk (5.9% → 8.9%; 2.6% → 4.9%) drinkers, and fewer being classed as lower risk drinkers (77.5% → 69.4%; 84.1 % → 76.3%).

Analysis suggested that residents of more deprived IMD quintiles were more likely to report both last year drinking, and more frequent drinking, but differences between typical and combined estimates of alcohol use were unrelated to neighbourhood level deprivation once the effect of individual levels SES and other sociodemographic variables were taken into account. In contrast there were significant differences in underreporting of use on the basis of drinking risk, independent of SES, with those classed as being at higher risk underreporting to a greater extent than lower and increasing risk groups.

Our final analysis extended those undertaken in Work Stream 2 and sought to identify whether self-reported health outcomes were associated with SES and the newly derived alcohol use estimates. In keeping with the earlier findings from the GLF, we found no relationship between increased deprivation or lower individual level SES and the health outcomes of interest that were independent of other important confounding factors. Hypothesis 3 suggested that more affluent populations are protected from alcohol related harm due to resilience factors such as good diet, exercise and greater life satisfaction. Our analysis suggested that whilst some of these factors on their own were important determinants of health, there was no interaction with deprivation or alcohol risk, suggesting that hypothesis 3 could not be sustained.

In the second part of the Work Stream we sought to identify whether data collected from two populations usually underrepresented, or not represented at all, in national estimates (University students and hostel service users) reported higher weekly alcohol unit consumption compared to the telephone survey population. Compared with the telephone survey estimate (independent of age), the hostel sample reported consuming 97.1% (males) and 222.1% (females) more units per week. Irrespective of age, the combined weekly estimate for students was 7.0% (men) and 20.0% (women) higher than the telephone survey estimate. Comparing 18-21 year olds only (the modal age range of UK university students), we estimated an increase in weekly units of 37.8% in men but a decrease of -20.3% in women. Deprivation and alcohol use was briefly examined in the hostel sample with respect to the SES (IMD quintile) of respondents. The survey enquired about postcode of residence; but for those currently sleeping rough (14.0%), the postcode of the service they were attending was used. Over half (62.0%) of respondents were allocated to the most deprived quintile (5) and this group reported the highest total mean weekly unit consumption, which was 42.5 units higher than the mean of other quintiles.

In summary, we did not find evidence to support the hypothesis that the alcohol harm paradox is due to underreporting of alcohol use in low SES groups.

5.2 Unanswered research questions and important research gaps

Our systematic literature reviews, and review of other cohort and case controlled studies show that differences in alcohol use explains some, but not all of, the variation in disease risk between high and low SES groups. Although our methodology was robust, and literature review comprehensive, one of the main limitations was the lack of data to conduct a meta-analysis in order to fully explore the interaction between patterns of alcohol use and SES in the risk for alcohol-attributable disease. We were therefore unable to estimate the overall size of the association between SES, alcohol consumption, and alcohol-attributable disease risk.

A lack of data prevented us from calculating SES-specific AAFs. Most of the existing literature identified only presented information on alcohol prevalence rather than weekly consumption data, and therefore would have led to an underestimate of alcohol attributable deaths⁵⁰. To derive SES-specific relative risks for alcohol-attributable conditions, systematic data on how the impact of proximate risk factors differs by SES is required. Individual patient data (IPD) meta-analysis is one approach that might address this as it is based on original 'raw' research data⁵¹.

However, IPD meta-analyses are large collaborative projects and are more time consuming and costly than traditional approaches to meta-analysis, and it is uncertain whether the academic data infrastructure currently exists for secure data sharing.

In addition to individual level factors, our reviews identified the potential role for systemic and structural determinants of health and risk such as gross national income and quality of life; access to universal healthcare and treatment processes; social networks and norms; environmental stress and neighbour/community institutions and resources. All these areas require further investigation. For example, previous work from our group⁶² suggested that geographically relative deprivation was important in understanding health risks; areas that were deprived compared to their geographic neighbours tended to report higher rates of poor health and life limiting long term illnesses, even after controlling for the absolute deprivation of the area itself.

As highlighted in Work Stream 1 there was inconsistency between studies in definitions of SES and the indicators used to measure it. In our cross sectional survey analyses we included a number of both individual and neighbourhood indicators of SES, but other authors have argued that the relative importance of these indicators with respect to alcohol harms may change across the life course and that it is also important to consider social mobility, as persistent deprivation may be associated with greater adverse health outcomes than acute experiences²². Alternative conceptualisations of SES such as human and social capital may also be useful to consider in this regard (e.g.⁷⁰).

The majority of previous studies have focused on the health effects of alcohol and alcohol related mortality, but there is also a need to quantify the social and secondary harms of alcohol consumption to the self and others, including interpersonal problems with family, finances and work, and involvement in public disorder and violence³. Whilst alcohol use is related to many social outcomes, the evidence available to establish causal relationships is scarce, and few studies have examined if there is a differential relationship between SES and these types of harm as there is with health. This is particularly important with regards to the development, monitoring, and communication of alcohol policy and licensing objectives, which include strong public order themes^{71, 72}.

Longitudinal studies and secondary analysis are still required to examine whether a poverty gradient exists. For the purposes of the current study we examined data from three consecutive years of the GLF, but this is an insufficient time period in which to understand the impact of loss of employment, or sustained periods of

under and un-employment. Furthermore, data is emerging that the global economic recession, which began in 2007/08, and is still affecting many countries, led to changes in alcohol consumption and broader health outcomes. Analysis from the USA suggesting that the recession was associated with an increase in alcohol abstention but also a rise in frequent binge drinking in those that drank ⁷³. In certain demographic subgroups, experiences of job or housing loss, or a change in economic prosperity, was associated with an increase in negative alcohol-related outcomes ⁷⁴. Similarly, recent work conducted in the UK ⁷⁵ specifically examining the impact of the recession on white adults (using the Health Survey for England) found that although population levels of alcohol use decreased, and lower income was associated with lower risk of binge drinking, unemployed drinkers were significantly more likely to binge drink after the onset of the recession, indicating important individual level SES effects.

5.3 Policy implications

This work confirms alcohol use as an important factor in determining health inequalities. Lower individual and neighbourhood SES are associated with higher rates of alcohol attributable conditions and alcohol related death or hospitalisation. Higher levels of deprivation were associated with an increased risk of heavy episodic drinking ('binge drinking'), and it is clear that current household alcohol use surveys underestimate the proportion of people who are classified at increasing and higher alcohol drinking risk.

A mixture of universal and targeted policy interventions would help to reduce inequalities and population level burdens of alcohol related harm. In England, alcohol use is recognised as an important general indicator of health in the Public Health Outcomes Framework, and reduction in alcohol related hospital admissions is included as a specific indicator. Modelling work suggests that policies such as alcohol Minimum Unit Pricing (MUP) do not place disproportionate financial burden on moderate drinkers in lower SES groups, but instead target hazardous and harmful drinkers across all levels of SES, as these tend to purchase the cheapest units of alcohol ⁷⁶. Therefore MUP may be one equitable and targeted means of reducing alcohol related harm.

There tends to be greater alcohol outlet density in more deprived neighbourhoods, and although there is mixed evidence regards to the association between opportunities to purchase alcohol, consumption and ill health, density has been shown to be associated with frequency of adolescent drinking in at least one UK study⁷⁷. Greater coherence in UK alcohol licensing legislation, such as the inclusion

of public health objectives, and evaluation of its impact on local health outcomes in addition to public disorder is recommended⁷⁸. Whilst this is being developed, the strategic use of Cumulative Impact Policies (CIP), which may be used to limit the number of new alcohol licenses granted or restrict variations in existing licenses, may be appropriate, especially where there is local concern about the impact of alcohol use in a community. Although ostensibly justified as a means of reducing crime and disorder and public nuisance, there have been examples of CIP use to help achieve health gains^v.

5.4 Concluding remarks

This work supported the hypothesis that the alcohol harm reduction paradox is genuine and is not a result of methodological biases. Precise mechanisms remain to be determined, although this programme of work identified useful avenues of investigation. Although our systematic reviews showed there is good evidence to conclude low individual and neighbourhood SES (relative to less deprived SES) is related to a range of alcohol related health outcomes and alcohol related mortality, a lack of published data means that the precise interaction between patterns of alcohol use, SES, and health outcomes remains uncertain. Analysis of high quality survey data (for England and Great Britain as a whole) suggests that there are differences between SES groups in patterns of alcohol use, but these are unrelated to self-reported health quality and use of health services. It is therefore important to conduct further data linkage activities to examine the relationship between patterns of alcohol use reported in surveys with records held in individual and neighbourhood data sets, such as Hospital Episode Statistics, NHS Health Check Data, and neighbourhood level alcohol profiles (e.g. local alcohol profiles for England; LAPE).

5.5 Scientific outputs emerging from this work

The following manuscripts are currently under review or being prepared for publication in 2015. Where possible these will be submitted to open access journals. Due to the extended delays typical in the scientific peer review and editorial process, links to papers will be uploaded to the ARUK website as they are published. These papers describe the methodology and findings of this project in much greater detail than the current report, and results are presented in the context of the wider scientific literature. The main findings are consistent across publication

^v For example, Liverpool City Council have introduced a number of CIPs with differing conditions <https://liverpool.gov.uk/council/strategies-plans-and-policies/licensing/special-cumulative-impact-policy/>

types and the conclusions of this report were informed by the same scientific considerations, albeit reported in less detail here.

1. Jones L, Bates G, McCoy E, Bellis MA. Relationship between alcohol-attributable disease, socioeconomic status and alcohol consumption: A systematic review. Under review
2. Jones L, Bates G, Bellis MA. The association between socioeconomic status and alcohol-related mortality and morbidity: A systematic review and meta-analysis of population-based cohort studies. Under review.
3. Jones L, Bellis MA. Socioeconomic status, area level deprivation and primary drink type of beer, spirits or wine. In Prep [a]. Expected submission date Q1 2015
4. Jones L, Bellis MA. Patterns of drinking, self-rated health and area level deprivation among adults in England. In Prep [b]. Expected submission date Q1 2015
5. Jones L, Bellis MA. Socioeconomic status, area level deprivation and drinking patterns among adult drinkers in England. In Prep [c]. Expected submission date Q1 2015
6. Jones L, McCoy E, Bellis MA, Sumnall HR. Understanding the alcohol harm paradox: data from a nationally representative survey and methodological considerations. In Prep. Expected submission date Q2 2015
7. Bellis MA, Hughes KE, Jones L, Morleo M, Nicholls J, McCoy E, Webster J, Sumnall HR. Holidays, celebrations and commiserations: measuring drinking during feasting and fasting to improve national and individual estimates of alcohol consumption. Under review
8. McCoy E, Jones L, Sumnall HR Alcohol consumption in UK hostel service users: patterns of use, meanings, motivations and harms. In Prep. Expected submission date Q1 2015
9. Jones L, Sheron N, Gilmore I, Nicholls J, Sumnall HR, Bellis MA. Pathways through which SES and alcohol consumption are related to harms. In Prep. Expected submission date Q2 2015

6 REFERENCES

1. Ellaway A, Macdonald L, Forsyth A, McIntyre S. The socio-spatial distribution of alcohol outlets in Glasgow city. *Health & Place*. 2009;16:167-72.
2. Hill TD, Ross CE, Angel RJ. Neighborhood disorder, psychophysiological distress, and health. *Journal of Health and Social Behavior*. 2005;46:170-86.
3. Babor TF, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, et al. *Alcohol: no ordinary commodity. Research and public policy*. New York: Oxford University Press; 2010.
4. Ahern J, Galea S, Hubbard A, Midanik L, Syme SL. "Culture of drinking" and individual problems with alcohol use. *American Journal of Epidemiology*. 2008;167:1041-9.
5. Meier PS, Meng Y, Holmes J, Baumberg B, Purhouse R, Hill-McManus D, et al. Adjusting for unrecorded consumption in survey and per capita sales data: Quantification of impact on gender- and age-specific alcohol-attributable fractions for oral and pharyngeal cancers in Great Britain. *Alcohol and Alcoholism*. 2013;48:241-9.
6. Boniface S, Kneale J, Shelton N. Drinking pattern is more strongly associated with under-reporting of alcohol consumption than socio-demographic factors: evidence from a mixed-methods study. *BMC Public Health*. 2014;14:1297.
7. Boniface S, Shelton N. How is alcohol consumption affected if we account for under-reporting? A hypothetical scenario. *European Journal of Public Health*. 2013;23(6):1076-81.
8. Stockwell T, Donath S, Cooper-Stanbury M, Chikritzhs T, Catalano P, Mateo C. Under-reporting of alcohol consumption in household surveys: a comparison of quantity-frequency and recent recall. *Addiction*. 2004;99:1024-33.
9. Galobardes B, Shaw M, Lawlor DA, Lynch JW, Davey Smith G. Indicators of socioeconomic position (part 1). *Journal of Epidemiology and Community Health*. 2006;60:7-12.
10. Makela P. Alcohol-related mortality as a function of socioeconomic status. *Addiction*. 1999;94:867-86.
11. van Oers JA, Bongers IM, van de Goor LA, Garretsen HF. Alcohol consumption, alcohol-related problems, problem drinking, and socioeconomic status. *Alcohol and Alcoholism*. 1999;34:78-88.
12. Romelsjo A, Lundberg M. The changes in the social class distribution of moderate and high alcohol consumption and of alcohol-related disabilities over time in Stockholm County in Sweden. *Addiction*. 1996;91:1307-23.
13. Morleo M, Dedman D, O'Farrell I, Burrows M, Tocque K, Perkins C, et al. *Alcohol-related hospital admissions: segmentation series 3*. Liverpool: North West Public Health Observatory, Centre for Public Health, Liverpool John Moores University, 2010.
14. Effiong K, Osinowo A, Pring A, Verne J. Deaths from liver disease: Implications for end of life care in England. National End of Life Care Intelligence Network, 2012.
15. Bloomfield K, Grittner U, Kramer S, Gmel G. Social inequalities in alcohol consumption and alcohol-related problems in the study countries of the EU

- concerted action 'Gender, Culture and Alcohol Problems: a Multi-national Study'. *Alcohol and Alcoholism*. 2006;41(i26-36).
16. Casswell S, Pledger M, Hooper R. Socio-economic status and drinking patterns in young adults. *Addiction*. 2003;98:601-10.
 17. Droomers M, Schrijvers C, Stronks K, van de Mheen D, Mackenbach J. Educational differences in excessive alcohol consumption: the role of psychosocial and material stressors. *Preventive Medicine*. 1999;29:1-10.
 18. Droomers M, Schrijvers C, Casswell S, Mackenbach J. Occupational level of the father and alcohol consumption during adolescence: patterns and predictors. *Journal of Epidemiology and Community Health*. 2003;57:704-10.
 19. Elgar F, Roberts C, Parry-Langdon N, Boyce W. Income inequality and alcohol use: a multilevel analysis of drinking and drunkenness in adolescents in 34 countries. *European Journal of Public Health*. 2005;15:245-50.
 20. Galea S, Ahern J, Rudenstine S, Vlahov D. Education inequality and use of cigarettes, alcohol and marijuana. *Drug and Alcohol Dependence*. 2007;90:S4-S15.
 21. San Jose B, van Oers HAM, van de Mheen HD, Garretsen HFL, Mackenbach JP. Stressors and alcohol consumption. *Alcohol and Alcoholism*. 2000;35:307-12.
 22. Caldwell TM, Rodgers B, Clark C, Jefferis BJMH, Stansfeld SA, Power C. Lifecourse socioeconomic predictors of midlife drinking patterns, problems and abstention: Findings from the 1958 British Birth Cohort Study. *Drug and Alcohol Dependence*. 2008;95:269-78.
 23. Chuang YC, Li YS, Wu YH, Chao HJ. A multilevel analysis of neighborhood and individual effects on individual smoking and drinking in Taiwan. *BMC Public Health*. 2007;7:151.
 24. Kuipers MAG, Jongeneel-Grimen B, Droomers M, Wingen M, Stronks K, Kunst AE. Why residents of Dutch deprived neighbourhoods are less likely to be heavy drinkers: the role of individual and contextual characteristics. *Journal of Epidemiology and Community Health*. 2013;67:587-94.
 25. Erskine S, Maheswaran R, Pearson T, Gleeson D. Socioeconomic deprivation, urban-rural location and alcohol-related mortality in England and Wales. *BMC Public Health*. 2010;10:99.
 26. Breakwell C, Baker A, Griffiths C, Jackson G, Fegan G, Marshall D. Trends and geographical variations in alcohol-related deaths in the United Kingdom, 1991-2004. *Health Statistics Quarterly*. 2007;33:6-24.
 27. Deacon L, Morleo M, Hannon KL, Cook PA, Tocque K, Perkins C, et al. Alcohol consumption: segmentation series report 2. Liverpool: North West Public Health Observatory, Liverpool John Moores University, 2011.
 28. Bellis MA, Hughes K, Cook PA, Morleo M. Off Measure: How we underestimate the amount we drink. London: Alcohol Concern, 2009.
 29. Catto S. How much are people in Scotland really drinking? A review of data from Scotland's routine national surveys. Edinburgh: NHS Health Scotland, 2008.
 30. Gmel G, Kuntsche E, Rehm J. Risky single occasion drinking: Bingeing is not bingeing. *Addiction*. 2011;106:1037-45.
 31. Dawson DA, Li TK, Grant BF. A prospective study of risk drinking: at risk for what? *Drug and Alcohol Dependence*. 2008;95:62-72.

32. Roerecke M, Rehm J. Irregular heavy drinking occasions and risk of ischemic heart disease: a systematic review and meta-analysis. *American Journal of Epidemiology*. 2010;171(6):633–44.
33. Gmel G, Bissery A, Gammeter R, Givel J-C, Calmes J-M, Yersin B, et al. Alcohol-attributable injuries in admissions to a Swiss emergency room—an analysis of the link between volume of drinking, drinking patterns and preattendance drinking. *Alcoholism: Clinical and Experimental Research*. 2006;30:501-9.
34. Upton V, Bellis MA, Perkins C. Violence-related accident and emergency attendances by English local authority area. Liverpool: North West Public Health Observatory, 2012.
35. Hart CL, Morrison DS, Batty GD, Mitchell RJ, Davey Smith G. Effect of body mass index and alcohol consumption on liver disease: analysis of data from two prospective cohort studies. *BMJ*. 2010;34:c1240.
36. Hart CL, Davey Smith G, Gruer L, Watt GCM. The combined effect of smoking tobacco and drinking alcohol on cause-specific mortality: a 30 year cohort study. *BMC Public Health*. 2010;10:789.
37. Berrigan D, Dodd K, Troiano RP, Krebs-Smith SM, Ballard Barbash R. Patterns of health behavior in U.S. adults. *Preventive Medicine*. 2003;36:615-23.
38. Poortinga W. The prevalence and clustering of four major lifestyle risk factors in an English adult population. *Preventive Medicine*. 2007;44:124-8.
39. Schuit AJ, van Loon AJM, Tijhuis M, Ocke MC. Clustering of lifestyle risk factors in a general adult population. *Preventive Medicine*. 2002;35:219-24.
40. Shankar A, McMunn A, Steptoe A. Health-related behaviors in older adults: relationships with socioeconomic status. *American Journal of Preventive Medicine*. 2010;38:39-46.
41. Do DP, Finch BK. The link between neighborhood poverty and health: context or composition? *American Journal of Epidemiology*. 2008;168:611-9.
42. Stafford M, Marmot M. Neighbourhood deprivation and health: does it affect us all equally? *International Journal of Epidemiology*. 2003;32(357-366).
43. Mulia N, Karriker-Jaffe KJ. Interactive influences of neighborhood and individual socioeconomic status on alcohol consumption and problems. *Alcohol and Alcoholism*. 2012;47:178-86.
44. Schmidt LA, Makela P, Rehm J, Room R. Alcohol: equity and social determinants. In: Blas E, Kurup AS, editors. *Equity, social determinants and public health programmes*. Geneva: World Health Organization; 2010.
45. Selin KH. Predicting alcohol-related harm by sociodemographic background: high prevalence versus high risk. *Contemporary Drug Problems*. 2005;32:547-88.
46. Mäkelä P, Paljärvi T. Do consequences of a given pattern of drinking vary by socioeconomic status? A mortality and hospitalisation follow-up for alcohol-related causes of the Finnish Drinking Habits Surveys. *Journal of Epidemiology and Community Health*. 2008;62:728–33.
47. Castillo-Carniglia Á, Kaufman JS, Pino P. Small area associations between social context and alcohol-attributable mortality in a middle income country. *Drug and Alcohol Dependence*. 2014;137:129-36.
48. Dietze PM, Jolley DJ, Chikritzhs TN, Clemens S, Catalano P, Stockwell T. Income inequality and alcohol attributable harm in Australia. *BMC Public Health*. 2009;9:70-.

49. Pascal R, Chikritzhs T, Gray D. Estimating alcohol-attributable mortality among Indigenous Australians: towards Indigenous-specific alcohol aetiologic fractions. *Drug and Alcohol Review*. 2009;28:196-200.
50. Jones L, Bellis MA. Updating England-Specific Alcohol-Attributable Fractions. Liverpool: Centre for Public Health, Faculty of Education, Health & Community, Liverpool John Moores University, 2014.
51. Stewart LA, Tierney JF. To IPD or not to IPD? Advantages and disadvantages of systematic reviews using individual patient data. *Evaluation and the Health Professions*. 2002;25:76-97.
52. Stokkeland K, Hilm G, Spak F, Franck J, Hultcrantz R. Different drinking patterns for women and men with alcohol dependence with and without alcoholic cirrhosis. *Alcohol and Alcoholism*. 2008;43:39-45.
53. Roizen R, Kerr WC, Fillmore KM. Cirrhosis mortality and per capita consumption of distilled spirits, United States, 1949-94: trend analysis. *BMJ*. 1999;319:666-700.
54. Becker U, Groenbaek M, Johansen D, Sorensen TIA. Lower risk for alcohol-induced cirrhosis in wine drinkers. *Hepatology*. 2002;35:868-75.
55. Pelletier S, Vaucher E, Aider R, Martin S, Perney P, Balmès JL, et al. Wine consumption is not associated with a decreased risk of alcoholic cirrhosis in heavy drinkers. *Alcohol and Alcoholism*. 2002;37:618-21.
56. Vilamovska A, Brown Taylor D, Bluthenthal RN. Adverse drinking-related consequences among lower income, racial, and ethnic minority drinkers: cross-sectional results. *Alcoholism: Clinical and Experimental Research*. 2009;33:645-53.
57. Ramstedt M, Boman U. Is spirits really the most harmful alcoholic beverage? Evidence from a recent alcohol survey in Sweden. *Contemporary Drug Problems*. 2011;38:579-97.
58. Lakshman R, McConville A, How S, Flowers J, Wareham N, Cosford P. Association between area-level socioeconomic deprivation and a cluster of behavioural risk factors: cross-sectional, population-based study. *Journal of Public Health*. 2011;33:234-45.
59. Bernard P, Charafeddine R, Frohlich KL, Daniel M, Kestens Y, Potvin L. Health inequalities and place: a theoretical conception of neighbourhood. *Social Science and Medicine*. 2007;65:1839-52.
60. Casswell S, Huckle T, Pledger M. Survey data need not underestimate alcohol consumption. *Alcoholism: Clinical and Experimental Research*. 2002;26:1561-7.
61. Customs HRa. Alcohol clearances per adult (1986/87-2010/11). Alcohol factsheet: March 2012. London: 2012.
62. Xhang Z, Cook PA, Lisboa PJ, Jarman IH, Bellis MA. The effects of deprivation and relative deprivation on self-reported morbidity in England: an area-level ecological study. *International Journal of Health Geographics*. 2013;12(5).
63. Dolan A. 'Good luck to them if they can get it': exploring working class men's understandings and experiences of income inequality and material standards. *Sociology of health and illness*. 2007;29(5):711-29.
64. Dibben C, Sigala M, Macfarlane A. Area deprivation, individual factors and low birth weight in England: is there evidence of an "area effect"? *Journal of Epidemiology and Community Health*. 2006;60:1053-9.

65. North West Public Health Observatory. Local Alcohol Profiles for England. August 2011 edition. Liverpool: North West Public Health Observatory, Liverpool John Moores University 2011.
66. HM Government. Homelessness Act 2002. London: 2002.
67. Searles JS, Helzer JE, Rose GL, Badger GJ. Concurrent and retrospective reports of alcohol consumption across 30, 90 and 366 days: interactive voice response compared with the timeline follow back. *Journal of Studies of Alcohol*. 2002;63:352-62.
68. Pew Research Center. Assessing the Representativeness of Public Opinion Surveys. Washington DC: 2012.
69. Gill JS, Donaghy M. Variation in the alcohol content of a 'drink' of wine and spirit poured by a sample of the Scottish population. *Health Education Research*. 2004;19:485-91.
70. Rocco L, Suhrcke M. Is social capital good for health? A European perspective. Copenhagen: WHO Regional Office for Europe, 2012.
71. Hadfield P. A hard act to follow: assessing the consequences of licensing reform in England and Wales. *Addiction*. 2007;102(2):177-80.
72. Nicholls J. Time for reform? Alcohol policy and cultural change in England since 2000. *British Politics*. 2012;7:250-71.
73. Bor J, Basu S, Coutts A, McKee M, Stuckler D. Alcohol use during the great recession of 2008-2009. *Alcohol and Alcoholism*. 2013;43(3):343-8.
74. Mulia N, Zenmore SE, Murphy R, Liu H, Catalano R. Economic loss and alcohol consumption and problems during the 2008 to 2009 U.S. recession. *Alcoholism: Clinical and Experimental Research*. 2014;38(4):1023-34.
75. Harhay MO, Bor J, Basu S, McKee M, Mindell JS, Shelton NS, et al. Differential impact of the economic recession on alcohol use among white British adults, 2004-2010. *European Journal of Public Health*. 2014;24(3):410-5.
76. Holmes J, Meng Y, Meier PS, Brennan A, Angus C, Campbell-Burton A, et al. Effects of minimum unit pricing for alcohol on different income and socioeconomic groups: a modelling study. *The Lancet*. 2015;383(9929):1655-64.
77. Young R, MacDonald L, Ellaway A. Associations between proximity and density of local alcohol outlets and alcohol use among Scottish adolescents. *Health and Place*. 2013;19(100):124-30.
78. Gillan E, Mahon L, MacNaughton P, Bowie L, Nicholls J. Using licensing to protect public health: from evidence to practice. London: Alcohol Research UK, 2014.

APPENDIX 1 QUESTIONNAIRES

National & Student Survey Questionnaire

1. INTERVIEWER NOTES

INTERVIEWER INITIALS: _____

SAMPLE GROUP: _____

DATE & TIME OF INTERVIEW: _____

LENGTH OF INTERVIEW: _____

[PLEASE NOTE, **MOST** PROMPTS ARE ONLY TO BE USED IF PARTICIPANTS ARE STRUGGLING]

2. SECTION A: INTRODUCTION AND SCREENING QUESTIONS

Good morning / afternoon / evening. My name is from Centre for Public Health, Liverpool John Moores University, and we are carrying out a survey about health and wellbeing, including some questions on alcohol. It does not matter if you do not drink alcohol, your views are still really important to us. On average, the interview takes about 10-15 minutes. All the information we collect will be kept in the strictest confidence and used for research purposes only. It will not be possible to identify any individual.

1. So that I can include you in the questionnaire, what was your age at your last birthday? _____
[END the survey if aged under 16 years]

2. Do you currently live in England?

Yes

☐

No

☐

[End the survey]

3. SECTION B: GENERAL HEALTH AND WELLBEING – PART ONE

I would like to ask you some questions about your general health and wellbeing.

3. In the last 12 months, have you been in hospital as an inpatient, overnight or longer (excluding admissions related to having a baby)?

Yes

☐

No

☐

4. In the last 12 months, have you been to an accident and emergency (A&E) department to get treatment for yourself?

No ☐

Yes ☐

5. Have you ever been diagnosed by a doctor or nurse with any of the following health conditions...?

Cancer

Yes ☐ No/Don't know ☐

Liver Disease

Yes ☐ No/Don't know ☐

Heart disease

Yes ☐ No/Don't know ☐

Diabetes (apart from when pregnant)

Yes ☐ No/Don't know ☐

6. All things considered, how would you rate your health in general on a scale of 1 to 10, where 1 is very poor health and 10 is excellent health? [Prompt for best guess if do not know]

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ Refused ☐

7. All things considered, how satisfied with your life are you on a scale of 1 to 10, where 1 is very dissatisfied with life and 10 is very satisfied with life? [Prompt for best guess if do not know]

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ Refused ☐

8. All things considered, how happy would you say your childhood was on a scale of 1 to 10, where 1 is a very unhappy childhood and 10 is a very happy childhood? [Prompt for best guess if do not know]
- 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ Refused ☐

4. **SECTION C: INITIAL ALCOHOL QUESTIONS**

I would now like to ask you some questions about alcohol.

9. **Have you ever drank alcohol?**

Yes ☐ → [Go to Q10]

No ☐ ↓

Can I just check, have you drank alcohol at all during your life?

9a. Yes ☐ [Go to Q10]

No ☐ → Have you never drank alcohol because of a health condition or complaint?

Yes ☐ [Go to Q42]

No, it is for other reasons ☐ [Go to Q42]

10. Have you drank any alcohol in the last 12 months, even if only very occasionally or only on special occasions?

Yes ☐ → [Go to Q11]

No ☐ ↓

10a. Can I just check, have you drank alcohol at all during the last 12 months even if only very occasionally or on special occasions?

Yes ☐ [Go to Q11]

No ☐ → If you never drank alcohol during the last 12 months, is it because of a health condition or complaint that you were experiencing or because you felt alcohol was damaging your health?

Yes ☐ [Go to Q38]

No, stopped for other reasons ☐ [Go to Q38]

11. **On average, how often have you drank alcohol in the last 12 months?** [SELECT ONE, Prompt for best guess if do not know]

- | | |
|------------------|--------------------------|
| Every day | <input type="checkbox"/> |
| 6 days a week | <input type="checkbox"/> |
| 5 days a week | <input type="checkbox"/> |
| 4 days a week | <input type="checkbox"/> |
| 3 days a week | <input type="checkbox"/> |
| 2 days a week | <input type="checkbox"/> |
| 1 day a week | <input type="checkbox"/> |
| 2–3 days a month | <input type="checkbox"/> |
| 1 day a month | <input type="checkbox"/> |
| Less often | <input type="checkbox"/> |

5. **SECTION D: DRINKING ON TYPICAL AND NON-TYPICAL DRINKING DAYS**

12. In the last 12 months, **on a typical day when you drank alcohol**, did you mainly consume alcohol at home (or at a friend's home), outside your home in pubs, restaurants etc or in a mixture of places (in the last 12 months)?

Mainly at home (or at a friend's home) ☐

Mainly in pubs, restaurants etc ☐

In a mixture of places ☐

13. In the last 12 months, **on a typical day when you drank alcohol** can you describe how much would you normally drink?

PROMPT IF REQUIRED: What we mean by typical is what you would normally drink on a day on which you were drinking in the last 12 months. This might be across one or more locations (e.g. at a friend's house and in a restaurant). If your drinking has changed considerably in the 12 months, select the type of drinking day that has occurred the most often.

[NOTE TO INTERVIEWER: Ask this as an open question – do not list options – If offered choices ask for most common]

		In a home	Outside a home	
WINE (including sparkling and champagne)	Glasses Standard bottles (or parts of e.g. 1/2)			
BEER	Pints Litres Regular Bottles Small Bottles Regular cans Small cans Other			
CIDER	Pints Litres Regular Bottles Small Bottles Regular cans Small cans Other			
SPIRITS	Singles or shots Doubles Larger than doubles Glass -Size unspecified Bottles (or parts of e.g. 1/2) [Ask bottle size]			
FORTIFIED WINE [PROMPT IF REQUIRED: This includes Martini, Port, Sherry, Vermouth]	Singles Doubles Larger than doubles Glass -Size unspecified Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 750ml, 1litre, not spec
LIQUEUR	Singles Doubles Larger than doubles Glass -Size unspecified Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 750ml, 1litre, not spec
PRE-MIXED SPIRITS or ALCOPOPS	Small bottles Large bottles			
COCKTAILS				
OTHER	Please state quantity and type			

13a...Is there anything else you would drink on a typical day when you drank? I do not need to know about non-alcoholic drinks.

14. In the last 12 months, did you have days when you drank A BIT MORE than a typical day? [PLEASE USE PROMPT FOR THIS QUESTION: e.g. weekends, holidays]

Yes ☐ No ☐ [Go to Q19]

15. On average, would you say that on these days when you drank a bit more, you mainly consumed alcohol at home (or at a friend's home), outside your home in pubs, restaurants etc or in a mixture of places (in the last 12 months)?

Mainly at home (or at a friend's home) ☐

Mainly in pubs, restaurants etc ☐

In a mixture of places ☐

16. Can you describe what you would drink on those days when you drank A BIT MORE alcohol? [NOTE: Do not list options – If offered choices ask for most common. PROMPT - if needed weekends, holidays]

		In a home	Outside a home	
WINE (including sparkling and champagne)	Glasses			
	Standard bottles (or parts of e.g. 1/2)			
BEER	Pints			
	Litres			
	Regular Bottles			
	Small Bottles			
	Regular cans			
	Small cans			
	Other			
CIDER	Pints			
	Litres			
	Regular Bottles			
	Small Bottles			
	Regular cans			
	Small cans			
	Other			
SPIRITS	Singles or shots			
	Doubles			
	Larger than doubles			
	Glass -Size unspecified			
	Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 700ml, 1litre, not spec
FORTIFIED WINE [PROMPT IF REQUIRED: This includes Martini, Port, Sherry, Vermouth]	Singles			
	Doubles			
	Larger than doubles			
	Glass -Size unspecified			
	Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 750ml, 1litre, not spec
LIQUEUR	Singles			
	Doubles			
	Larger than doubles			
	Glass -Size unspecified			
	Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 750ml, 1litre, not spec
PRE-MIXED SPIRITS or ALCOPOPS	Small bottles			
	Large bottles			
COCKTAILS				
OTHER	Please state quantity and type			

16a...Is there anything else you would drink on those days when you drank a bit more? I do not need to know about non-alcoholic drinks.

17. How often would you say you have days when you drank a bit more (in the last 12 months)?

Number of days in a... [COMPLETE ONE]

_____ week
 _____ month
 _____ year

18. Would you say those days when you drank a bit more were INSTEAD OF or AS WELL AS your typical drinking days (in the last 12 months)?

Instead of ☐ As well as ☐

19. In the last 12 months, did you have days when you drank A LOT MORE than a typical day? [PLEASE USE PROMPT FOR THIS QUESTION: e.g. parties, weddings, New Year's Eve]

Yes ☐

No ☐ [Go to Q24]

20. On average, would you say that on these days when you drank a lot more, you mainly consumed alcohol at home (or at a friend's home), outside your home in pubs, restaurants etc or in a mixture of places (in the last 12 months)?

Mainly at home (or at a friend's home) ☐

Mainly in pubs, restaurants etc ☐

In a mixture of places ☐

21. Can you describe what you would drink on those days when you drank QUITE A LOT MORE alcohol... **[NOTE: Do not list options – If offered choices ask for most common. PROMPT - if needed parties, weddings, New Year's Eve]**

		In a home	Outside a home	
WINE (including sparkling and champagne)	Glasses			
	Standard bottles (or parts of e.g. 1/2)			
BEER	Pints			
	Litres			
	Regular Bottles			
	Small Bottles			
	Regular cans			
	Small cans			
	Other			
CIDER	Pints			
	Litres			
	Regular Bottles			
	Small Bottles			
	Regular cans			
	Small cans			
	Other			
SPIRITS	Singles or shots			
	Doubles			
	Larger than doubles			
	Glass -Size unspecified			
	Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 700ml, 1litre, not spec
FORTIFIED WINE [PROMPT IF REQUIRED: This includes Martini, Port, Sherry, Vermouth]	Singles			
	Doubles			
	Larger than doubles			
	Glass -Size unspecified			
	Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 750ml, 1litre, not spec
LIQUEUR	Singles			
	Doubles			
	Larger than doubles			
	Glass -Size unspecified			
	Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 750ml, 1litre, not spec
PRE-MIXED SPIRITS or ALCOPOPS	Small bottles			
	Large bottles			
COCKTAILS				
OTHER	Please state quantity and type			

21a ...Is there anything else you would drink on those days when you drank quite a lot more? I do not need to know about non-alcoholic drinks.

22. How often would you say you had days when you drank quite a lot more (in the last 12 months)?

Number of days in a... [SELECT ONE] _____ week

_____ month

_____ year

23. Would you say those days when you drank quite a lot more were INSTEAD OF or AS WELL AS your typical drinking days (in the last 12 months)?

Instead of ☐

As well as ☐

24. In the last 12 months, were there days when you still drank alcohol but drank LESS than on a typical day drinking?

[Prompt **if asked**: in the run up to an important event, time in the year when you are detoxing]

Yes ☐ No ☐ [Go to SECTION E]

25. On average, would you say that on these days when you drank a bit less, you mainly consumed alcohol at home (or at a friend's home), outside your home in pubs, restaurants etc or in a mixture of places (in the last 12 months)?

Mainly at home (or at a friend's home) ☐

Mainly in pubs, restaurants etc ☐

In a mixture of places ☐

26. Can you describe what you would drink on those days when you drank LESS alcohol? [NOTE TO INTERVIEWER: ASK

THIS AS AN OPEN QUESTION, DO NOT LIST OPTIONS UNLESS NEEDED, Prompt if asked: in the run up to an

important event, time in the year when you are detoxing]

		In a home	Outside a home	
WINE (including sparkling and champagne)	Glasses			
	Standard bottles (or parts of e.g. 1/2)			
BEER	Pints			
	Litres			
	Regular Bottles			
	Small Bottles			
	Regular cans			
	Small cans			
	Other			
CIDER	Pints			
	Litres			
	Regular Bottles			
	Small Bottles			
	Regular cans			
	Small cans			
	Other			
SPIRITS	Singles or shots			
	Doubles			
	Larger than doubles			
	Glass -Size unspecified			
	Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 700ml, 1litre, not spec
FORTIFIED WINE [PROMPT IF REQUIRED: This includes Martini, Port, Sherry, Vermouth]	Singles			
	Doubles			
	Larger than doubles			
	Glass -Size unspecified			
	Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 750ml, 1litre, not spec
LIQUEUR	Singles			
	Doubles			
	Larger than doubles			
	Glass -Size unspecified			
	Bottles (or parts of e.g. 1/2) [Ask bottle size]			Bottle 350, 500, 750ml, 1litre, not spec
PRE-MIXED SPIRITS or ALCOPOPS	Small bottles			
	Large bottles			
COCKTAILS				
OTHER	Please state quantity and type			

26a...Is there anything else you would drink on those days when you drank less? I do not need to know about non-alcoholic drinks.

27. How often would you say that you had days when you drank less but still drank alcohol (in the last 12 months)?

Number of days in a... [SELECT ONE] _____ week
 _____ month
 _____ year

28. Would you say the days when you drank less were INSTEAD OF or AS WELL AS your typical drinking days (in the last 12 months)?

Instead of ☐ As well as ☐

6. **SECTION E: DRINK TYPES AND MEASURES**

7. THE ANSWERS TO THE FOLLOWING QUESTIONS ARE BASED ON ANSWERS TO ALCOHOL QUANTITIES QUESTIONS (Q12, 15, 20 & 25), AS WELL AS THE DRINKING LOCATION QUESTIONS (Q13, 16, 21 & 26). FOR EXAMPLE, IF A PARTICIPANT HAS REPORTED DRINKING ANY QUANTITY OF WINE IN ANY OF THE DRINKING QUANTITY QUESTIONS, THEY NEED TO ANSWER THE WINE QUESTIONS BELOW. IF THE WINE WAS CONSUMED ONLY IN A HOME (IN ANY OF THE DRINKING QUANTITY QUESTIONS COMBINED), THEY ONLY NEED TO ANSWER THE QUESTIONS IN RELATION TO DRINKING WINE IN A HOME. IF THE WINE WAS CONSUMED ONLY OUTSIDE A HOME (IN ANY OF THE DRINKING QUANTITY QUESTIONS COMBINED), THEY ONLY NEED TO ANSWER THE QUESTIONS IN RELATION TO DRINKING WINE OUTSIDE A HOME. IF THE PARTICIPANT DRINKS IN MULTIPLE SETTINGS (IN ANY OF THE QUANTITIES QUESTIONS), QUESTIONS FOR BOTH SETTINGS NEED TO BE ASKED. THIS IS THE SAME THEN FOR EACH OF THE DRINK TYPES (BEER, ETC).

29. **WINE**

- a. ALL WINE DRINKERS: What type of wine do you normally drink...? [SELECT ONE]
- Red wine ☐
- White wine ☐
- Rose wine ☐
- Sparkling wine (Note to interviewer, this includes champagne) ☐
- b. HOME WINE DRINKERS ONLY: At HOME how many glasses would you normally get from a bottle of wine (if you were to pour out the whole bottle)?
- _____ glasses [Prompt for guess if they do not know]
- I do not drink wine at home ☐
- c. OUT WINE DRINKERS ONLY: When out in a PUB, BAR or RESTAURANT, would you normally have a...? [SELECT ONE]
- Small glass ☐ [Prompt if asked: 125ml]
- Medium glass ☐ [Prompt if asked: 175ml]
- Large glass ☐ [Prompt if asked: 250ml]
- A spritzer ☐
- I do not drink wine in a pub, bar or restaurant ☐

8.

30. **BEER**

- a. HOME BEER DRINKERS ONLY: At HOME what type of beer would you normally drink...? [SELECT ONE]
- Lager ☐
- Bitter ☐
- Stout/Guinness ☐
- Shandy ☐
- Other ☐ [Ask Brand _____]
- I do not normally drink beer at home ☐ [Go to Q14c]
- b. HOME BEER DRINKERS ONLY: Is that...? [SELECT ONE]
- Low alcohol ☐ [Prompt if asked: *That's less than 3% ABV; e.g. C2*]
- Normal strength ☐ [Prompt if asked: *That's 3% or more & less than 6% ABV; e.g. Becks, Stella Artois*]
- Higher strength ☐ [Prompt if asked: *That's 6% ABV or more e.g. King Cobra, Skol Super, Leffe Blonde*]
- Don't know ☐ [Ask Brand _____]
- c. OUT BEER DRINKERS ONLY: When out in a PUB, BAR or RESTAURANT what type of beer would you normally drink...? [SELECT ONE]
- Lager ☐
- Bitter ☐
- Stout/Guinness ☐
- Shandy ☐
- Other ☐ [Ask Brand _____]
- I do not normally drink beer in a pub, bar or restaurant ☐ [Go to Q15]

- d. OUT BEER DRINKERS ONLY: Is that...? [SELECT ONE]
- Low alcohol ☐ [Prompt if asked: *That's less than 3% ABV; e.g. C2*]
- Normal strength ☐ [Prompt if asked: *That's 3% or more & less than 6% ABV; e.g. Becks, Stella Artois*]
- Higher strength ☐ [Prompt if asked: *That's 6% ABV or more e.g. King Cobra, Skol Super, Leffe Blonde*]
- Don't know ☐ [Ask Brand _____]

31. CIDER OR PERRY

- a. HOME CIDER DRINKERS ONLY: At HOME what strength cider or perry would you normally drink...? [SELECT ONE]
- Normal strength ☐ [Prompt if asked: *That's 3% or more & less than 6% ABV; e.g. Magners, Strongbow*]
- Stronger ☐ [Prompt if asked: *That's 6% ABV or more, e.g. Diamond White, Frosty Jack*]
- Don't know ☐ [Ask Brand _____]
- I do not normally drink cider at home ☐
- b. OUT CIDER DRINKERS ONLY: When out in a PUB, BAR or RESTAURANT what strength cider or perry would you normally drink...? [SELECT ONE]
- Normal strength ☐ [Prompt if asked: *That's 3% or more & less than 6% ABV; e.g. Magners, Strongbow*]
- Stronger ☐ [Prompt if asked: *That's 6% ABV or more, e.g. Diamond White, Frosty Jack*]
- Don't know ☐ [Ask Brand _____]
- I do not normally drink cider in a pub, bar or restaurant ☐

9.

32. SPIRITS OR SHOTS

- a. HOME SPIRITS DRINKERS ONLY: At HOME would you normally drink measures like...? [SELECT ONE]
- Singles ☐
- Doubles ☐
- Larger than doubles ☐ [Prompt for best guess if do not know]
- I do not normally drink spirits or shots at home ☐
- b. OUT SPIRITS DRINKERS ONLY: When out in a PUB, BAR or RESTAURANT would you normally drink...? [SELECT ONE]
- Singles ☐
- Doubles ☐
- Larger than doubles ☐ [Prompt for best guess if do not know]
- I do not normally drink spirits or shots in a pub, bar or restaurant ☐

10.

33. FORTIFIED WINES AND/OR LIQUEURS

- [PROMPT IF REQUIRED: This includes Martini, Port, Sherry, Vermouth]
- a. HOME FORTIFIED DRINKERS ONLY: At HOME, would you normally drink measures like...? [SELECT ONE]
- Singles ☐
- Doubles ☐
- Larger than doubles ☐ [Prompt for best guess if do not know]
- I do not normally drink fortified wines and/or liqueurs at home ☐
- b. OUT FORTIFIED DRINKERS ONLY: When out in a PUB, BAR or RESTAURANT would you normally drink...? [SELECT ONE]
- Singles ☐
- Doubles ☐
- Larger than doubles ☐ [Prompt for best guess if do not know]
- I do not normally drink fortified wines in a pub, bar or restaurant ☐

11. SECTION F: DRINKING ON DIFFERENT TYPES OF OCCASIONS

In the last 12 months have you changed **how often** you drank or **how much** you drank **on any of the following occasions ...?** [NOTE: Ensure people are reminded this is only for events in the last 12 months – tick NA if they did not have e.g. a funeral. Prompt for best guess if do not know]. DP: PLEASE ASK YES/NO QUESTION FOR **HOW OFTEN** BY OCCASION. THEN FOR 'YES' ASK 'and for how many days in a week?' THEN 'and for how many weeks in a year?' PLEASE ASK YES/NO QUESTION FOR **HOW MUCH** BY OCCASION. THEN FOR 'YES' FOR HOW MUCH ASK 'and compared to a typical day when you drank, did you drink less, a bit more or a lot more?' THEN 'and on how many occasions in the last 12 months?'

	34A. How often you drank?			34B. ...And for how many days in a week?								35A. How much you drank?			35B. ...And compared to a typical day when you drank, did you drink...?				Q36. If yes for Q34A and/or Q35A,for how many weeks
	Yes	No	NA									Yes	No	NA	Nothing	A Bit Less	A Bit More	A Lot More	
i) Around Christmas and New Year	1	2	3	<1	1	2	3	4	5	6	7	1	2	3	0	1	2	3	
ii) In the summer	1	2	3	<1	1	2	3	4	5	6	7	1	2	3	0	1	2	3	
iii) When on holiday at home	1	2	3	<1	1	2	3	4	5	6	7	1	2	4	0	1	2	3	
iv) When on holiday away from home	1	2	3	<1	1	2	3	4	5	6	7	1	2	3	0	1	2	3	
v) Bank Holiday weekends	1	2	3	<1	1	2	3	4	5	6	7	1	2	3	0	1	2	3	
vi) Working away from home	1	2	3	<1	1	2	3	4	5	6	7	1	2	3	0	1	2	3	
vii) In January (after New Year)	1	2	3	<1	1	2	3	4	5	6	7	1	2	3	0	1	2	3	
viii) During other religious periods e.g. Lent, Ramadan	1	2	3	<1	1	2	3	4	5	6	7	1	2	3	0	1	2	3	
ix) After a bereavement or a funeral	1	2	3	<1	1	2	3	4	5	6	7	1	2	3	0	1	2	3	
x) During periods of unemployment or other change in work patterns	1	2	3	<1	1	2	3	4	5	6	7	1	2	3	0	1	2	3	

In the last **12 months** have you changed **how often** you drank or **how much** you drank on any of the following occasions ...? [NOTE: Ensure people are reminded this is only for events in the last 12 months – tick NA if they did not have e.g. a funeral. Prompt for best guess if do not know]. DP: PLEASE ASK YES/NO QUESTION FOR **HOW OFTEN** BY OCCASION. THEN FOR 'YES' ASK 'and for how many days in a week?' THEN 'and for how many weeks in a year?' PLEASE ASK YES/NO QUESTION FOR **HOW MUCH** BY OCCASION. THEN FOR 'YES' FOR HOW MUCH ASK 'and compared to a typical day when you drank, did you drink less, a bit more or a lot more? THEN 'and on how many occasions in the last 12 months?

	37A. How much you drank?			37B. ...And compared to a typical day when you drank, did you drink...?				37C. No. of occasions
	Yes	No	NA	Nothing	A Bit Less	A Bit More	A Lot More	
i) When you celebrated yours, a friends or close relative's birthday	1	2	3	0	1	2	3	
ii) At a wedding	1	2	3	0	1	2	3	
iii) At an engagement, hen or stag party	1	2	3	0	1	2	3	
iv) Watching an important sporting event on TV or live	1	2	3	0	1	2	3	
v) When friends came to stay or you stayed with friends	1	2	3	0	1	2	3	
vi) At a festival, rock or pop concert, or other show	1	2	3	0	1	2	3	

SECTION G: DRINKING IN THE PAST

38. At what age did you first start drinking alcohol regularly? [Prompt if asked for: By regularly we mean at least once a month.] _____ years

Not applicable ☐ (i.e. respondent has never drank at least once a month)

39. At what age did you first drink enough alcohol to feel drunk? [Prompt if asked for: By which we mean you felt the effects of alcohol such that your speech was slurred or you were unsteady on your feet] _____ years

Not applicable ☐ (i.e. respondent has never drank enough alcohol to feel drunk)

40. I would like to ask you about your alcohol consumption in the past. [FILTER OPTIONS BY AGE AT Q1 – DO NOT ASK IF <19 years old]

a. When you were aged XX [from list below], how often did you drink alcohol?

Aged 80	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 70	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 60	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 50	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 40	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 30	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 18	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0

- b. When you were aged XX, how often did you get drunk or drink heavily? [Prompt: *By drinking heavily we mean drinking more than 5 standard drinks on any one day. By drunk we mean you felt the effects of alcohol such that your speech was slurred or you were unsteady on your feet*]

Aged 80	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 70	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 60	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 50	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 40	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 30	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0
Aged 18	Don't know	7W	6W	5W	4W	3W	2W	1W	2-3M	1M	<1M	0

I would like to ask you some questions about times in your life when your drinking may have caused you problems

41. Has there ever been a period or periods of your life when your drinking has caused you a serious problem ?

[PROMPT IF NEEDED – a problem that had a large or long term impact]

No ☐ [GO TO Q42] Yes ☐

41. a) If so, was this problem with regards to...

Your work, studies or employment opportunities No ☐ Yes ☐

Your marriage or other intimate relationships No ☐ Yes ☐

Your relationships with your friends or family members No ☐ Yes ☐

Your finances No ☐ Yes ☐

Your physical or mental health No ☐ Yes ☐

Other No ☐ Yes ☐

12. SECTION H: GENERAL HEALTH AND WELLBEING (PART TWO) AND FINAL QUESTIONS

To help us understand the people who are replying to this survey, it is important that we ask you a few questions about yourself. As with all the questions, your answers will be completely confidential.

42. Do you smoke cigarettes, cigars or pipes?

Yes ☐ → 42. a) Is that...? daily ☐ [Go to Q43] occasionally ☐ [Go to Q43]

No ☐ [Go to Q42b]

Refused ☐

b) Did you used to smoke?

Yes ☐ Was that...? daily ☐ occasionally ☐

No, respondent has never smoked ☐

43. How many portions of fruit or vegetables, excluding potatoes, do you eat on a typical day? [Prompt: *Examples include 3 heaped tablespoons of carrots, an apple, a side salad, glass of fruit juice or two spears of broccoli.*]

_____ portions a day

44. Can you tell me how often you engage in any activity, such as brisk walking, jogging, cycling or swimming, long enough to work up a sweat or get out of breath?

How many days per week? _____

Or _____ days per month _____

45. Enter the sex of the respondent

Male ☐ [Go to Q47] Female ☐

46. Have you been pregnant in the last 12 months? No ☐ Yes ☐ Refused ☐

47. How would you describe your ethnic group? [Do not read list unless requested, select one only]

- | | | |
|------------------------|-------------------------|--------------------------|
| WHITE | British | <input type="checkbox"/> |
| | Irish | <input type="checkbox"/> |
| | Other | <input type="checkbox"/> |
| MIXED | White & Black Caribbean | <input type="checkbox"/> |
| | White & Black African | <input type="checkbox"/> |
| | White & Asian | <input type="checkbox"/> |
| | Other | <input type="checkbox"/> |
| ASIAN OR ASIAN BRITISH | Indian | <input type="checkbox"/> |
| | Pakistani | <input type="checkbox"/> |
| | Bangladeshi | <input type="checkbox"/> |
| | Other | <input type="checkbox"/> |
| BLACK OR BLACK BRITISH | Caribbean | <input type="checkbox"/> |
| | African | <input type="checkbox"/> |
| | Other | <input type="checkbox"/> |
| CHINESE | | <input type="checkbox"/> |
| OTHER ETHNIC GROUP | | <input type="checkbox"/> |
| PREFER NOT TO SAY | | <input type="checkbox"/> |

48. What is your current relationship status? [Do not read list unless requested, select one only]

- | | | |
|--|--------------------------|--------------------------------------|
| Married and living with husband or wife | <input type="checkbox"/> | |
| In a legally recognised civil partnership | <input type="checkbox"/> | |
| Partner, but not married | <input type="checkbox"/> | Co-habiting <input type="checkbox"/> |
| Widowed | <input type="checkbox"/> | |
| Married and separated from husband or wife | <input type="checkbox"/> | |
| Divorced | <input type="checkbox"/> | |
| Single, never married | <input type="checkbox"/> | |

49. What is your current employment status for instance full time? [Do not read list unless requested, select all that apply]

- | | | |
|-----------------------------|--------------------------|---------------------------------------|
| Full-time employed | <input type="checkbox"/> | |
| Part-time employed | <input type="checkbox"/> | → Check if they are a student as well |
| Self employed | <input type="checkbox"/> | |
| Unemployed | <input type="checkbox"/> | → Check if they are a student as well |
| Student | <input type="checkbox"/> | |
| Long-term sick or disabled | <input type="checkbox"/> | |
| Retired | <input type="checkbox"/> | |
| House wife or house husband | <input type="checkbox"/> | |
| Other | <input type="checkbox"/> | |

50. Please tell me which, if any, of the following is the highest educational or professional qualification you have obtained?

- | | |
|---------------------------------------|--------------------------|
| A GCSE / O-level / CSE | <input type="checkbox"/> |
| B Vocational qualifications (=NVQ1+2) | <input type="checkbox"/> |

- C A-Level or equivalent (=NVQ3) ☐
- D Bachelor Degree or equivalent (=NVQ4) ☐
- E Masters / PhD or equivalent ☐
- F Other ☐
- G No formal qualifications ☐
- H Still studying ☐
- Don't know ☐

51. **Approximately how tall are you?** ____ ft ____ in _____ metres ____ cm

52. **Approximately how much do you weigh?** _____Stones ____ lbs or _____ kg ☐ Refused

53. **What is your postcode?** This will not be used to contact you or shared with anyone else but will enable an in-depth analysis of the data you have provided.

If the participant is a student, and aged 25 years or under, ask for their parents'/non-term time postcode. If the participant is a student and aged over 25 years, ask for their term-time postcode.

_____ ☐ Refused

Hostel Services Questionnaire

INTERVIEWER NOTES:

INTERVIEW LOCATION: _____

INTERVIEWER INITIALS: _____

DATE OF INTERVIEW: _____

INTERVIEW START TIME: _____

INTERVIEW FINISH TIME: _____

SECTION A: INTRODUCTION AND ABOUT YOU

Hello, my name is _____. We are carrying out a survey about health, including some questions on alcohol. It does not matter if you do not drink alcohol, your views are still really important. It should take about 10-15 minutes to do. Your answers will only be used for the project and will not be shared with anyone. First I'd like to ask you a few general questions about you.

1. How old are you?

2. What is your gender?

Male	Female
------	--------

3. Which of these would you say you are? (ethnicity) [show list]

4. Are you currently in work? [show list]

5. Do you have any of these qualifications? [show list]

6. Roughly how tall are you?

7. Roughly how much do you weigh?

	Refused
--	---------

8. Where are you staying at the moment (select one from options below)?

In own house/flat

Yes

With family/friends

Yes

In a hostel

Yes

Sleeping rough

Yes

Other

Yes

Please describe:

8a. Do you know the postcode?

(Partial is fine, if don't know, ask for area of city/town or hostel name)

--

9. Have you stayed in a hostel **in the last 12 months?**

Yes	No
-----	----

9a. If so, can you tell me when and for how long?

PROMPTS: Weather, Christmas, temperature

--

10. Have you slept rough/on the streets **in the last 12 months?**

Yes	No
-----	----

10a. If so, can you tell me when and for how long?

PROMPTS: Weather, Christmas, temperature

--

11. Have you spent any time in alcohol treatment **in the last 12 months?**

Yes	No
-----	----

11a. If so, can you tell me what kind of treatment it was, when it occurred and for how long?

TREATMENT PROMPTS: Support groups, rehab, detox

SEASONAL PROMPTS: Weather, Christmas, temperature

--

11b. If so, did you stop drinking during this time?

Yes	Partly	No
-----	--------	----

12. Have you spent any time in prison **in the last 12 months?**

Yes	No
-----	----

12a. If so, can you tell me when and for how long?

PROMPTS: Weather, Christmas, temperature

--

12b. If so, did you stop drinking during this time?

Yes	Partly	No
-----	--------	----

[Go to SECTION B]

SECTION B: GENERAL HEALTH: I would like to ask you some questions about your health.

13. In the last year, have you been admitted to hospital, overnight or longer?

Yes	No
-----	----

13a. If so, can you tell me when and for how long?

PROMPTS: Weather, Christmas, temperature

--

13a. If so, did you stop drinking during this time?

Yes	Partly	No
-----	--------	----

14. In the last year, have you been to accident and emergency (A&E) to get treatment for yourself?

Yes	No
-----	----

14a. If so, can you tell me when and for how long?

PROMPTS: Weather, Christmas, temperature

--

15. Do you have any of the following health conditions...? Or have you ever had...?

Cancer

Yes	No
-----	----

Liver Disease

Yes	No
-----	----

Heart Disease

Yes	No
-----	----

Diabetes

Yes	No
-----	----

16. How would you rate your health generally? [Show scale] Where 1 is very poor and 10 is excellent?

Very poor

Excellent

1	2	3	4	5	6	7	8	9	10	Refused
---	---	---	---	---	---	---	---	---	----	---------

17. How satisfied are you with your life? [Show scale] Where 1 is very dissatisfied and 10 is very satisfied?

Very dissatisfied

Very satisfied

1	2	3	4	5	6	7	8	9	10	Refused
---	---	---	---	---	---	---	---	---	----	---------

18. How happy was your childhood? [Show scale] Where 1 is very unhappy and 10 is very happy?

Very unhappy

Very happy

1	2	3	4	5	6	7	8	9	10	Refused
---	---	---	---	---	---	---	---	---	----	---------

[Go to SECTION C]

SECTION C: INITIAL ALCOHOL QUESTIONS

I would like to ask you about alcohol.

19a. Have you ever drank alcohol?

Yes	No
→ Q20a	

19b. Can I just check, have you drank alcohol **at all** during your life?

Yes	No
→ Q20a	

19c. **If you have never drank alcohol**, was this because of a health condition or complaint?

Yes	No, other reasons
→THANK PARTICIPANT, END	

20a. Have you drank alcohol **in the last year**?

Yes	No
→ Q21a	

20b. Can I just check, have you drank any alcohol **at all in the last year**?

Yes	No
→ Q21a	

20c. **If you did not drink alcohol in the last year**, was it because you felt it was damaging your health?

Yes	No, other reasons
→THANK PARTICIPANT, END	

21. Which of the following types of alcohol have you drank in the last year? [TICK ALL THAT APPLY, Prompt for best guess if do not know]

Wine
Beer
Cider or Perry
Spirits
Liqueurs
Fortified wine
Pre-mixed spirits or Alcopops
Cocktails
Other

Yes	No
Yes	No
Yes	No
Yes	No
Yes	No
Yes	No
Yes	No
Yes	No
Yes	No

Examples...

(e.g. Red, White, Rose, Sparkling wine, Spritzers)
(e.g. Lager, Bitter, Guinness, Stout, Shandy)
(e.g. Apple, Pear, Other flavour, Strongbow, Frosty Jack)
(e.g. Brandy, Whiskey, Vodka, Gin, Bacardi – as shots or with mixer)
(e.g. Baileys, Cointreau, Grand Marnier)
(e.g. Pimms, Sherry, Port, Vermouth, Martini)
(e.g. Bacardi Breezers, WKD, Smirnoff Ice)
(Manhattan, Tequila sunrise, White Russian)

Please describe:

--

22. That you know of, was any of the alcohol that you have drank in the last year homebrewed?

Yes	No	Don't know	Refused
-----	----	------------	---------

23. There are other products with alcohol in that are not intended for drinking such as hand sanitizer, mouthwash or industrial alcohol. Did you drink any of these types of products in the last year?

Yes	No	Don't know	Refused
-----	----	------------	---------

24. Do you get alcohol from any of the places listed below?

Pub/club	Yes	No
Supermarket	Yes	No
Off licence	Yes	No
Corner shop	Yes	No
Family	Yes	No
Friends	Yes	No
Someone else you know	Yes	No
From the back of a van	Yes	No
Other – provide details	Yes	No

[Go To SECTION D]

SECTION D: TYPICAL DRINKING WEEKS

Using the calendar I would like to build a picture of your drinking over the last year.

25. Are there any factors that affect how much you drink? (e.g. money available)

Yes	No
→ If yes , complete one drinking chart for days when money is available, one for when money is not available (Section F a and b)	→ If no , complete one drinking chart for typical week only (Section F a)

26. Can you describe a usual or typical week of drinking? If participant's consumption is affected by e.g. money, complete the grid for a typical week with money and complete grid two for when there is no money. **In the last year**, on the days when you drank alcohol (and you had money), what did you drink in a normal week and how much? [Do not show list. Prompt for best guess] Let's start with a normal Monday.

GRID ONE: TYPICAL WEEK OR TYPICAL WEEK WITH MONEY

		M	T	W	T	F	S	S
WINE	Glasses							
	Standard bottles (or parts of e.g. 1/2)							
BEER	Pints							
	Litres							
	Regular Bottles							
	Small Bottles							
	Regular cans							
	Small cans							
	Other							
CIDER	Pints							
	Litres							
	Regular Bottles							
	Small Bottles							
	Regular cans							
	Small cans							
SPIRITS	Singles or shots							
	Doubles							
	Larger than doubles							
	Glass -Size unspecified							
	Bottles (or parts of e.g. 1/2) [Ask bottle size]							
FORTIFIED WINE [includes Martini, Port, Sherry, Vermouth]	Singles							
	Doubles							
	Larger than doubles							
	Glass -Size unspecified							
	Bottles (or parts of e.g. 1/2) [Ask bottle size]							
LIQUEUR	Singles							
	Doubles							
	Larger than doubles							
	Glass -Size unspecified							
	Bottles (or parts of e.g. 1/2) [Ask bottle size]							
PRE-MIXED SPIRITS or ALCOPOPS	Small bottles							
	Large bottles							
COCKTAILS								
OTHER (state quantity and type)	Type:							
	Type:							
	Type:							
	Type:							

NOTES (if required but please complete table immediately after interview):

Monday:

Tuesday:

Wednesday:

Thursday:

Friday:

Saturday:

Sunday:

26. How often have you drank like this **in the last year**? Or have the money to drink like this? How many weeks a month?

27. Can you describe a usual or typical week of drinking when the participant has no money? **In the last year**, on the days when you drank alcohol (and you had no money), what did you drink in a normal week and how much? [Do not show list. Prompt for best guess] Let's start with a normal Monday.

GRID ONE: TYPICAL WEEK WITH NO MONEY

		M	T	W	T	F	S	S
WINE	Glasses							
	Standard bottles (or parts of e.g. 1/2)							
BEER	Pints							
	Litres							
	Regular Bottles							
	Small Bottles							
	Regular cans							
	Small cans							
	Other							
CIDER	Pints							
	Litres							
	Regular Bottles							
	Small Bottles							
	Regular cans							
	Small cans							
	Other							
SPIRITS	Singles or shots							
	Doubles							
	Larger than doubles							
	Glass -Size unspecified							
	Bottles (or parts of e.g. 1/2) [Ask bottle size]							
FORTIFIED WINE <i>[includes Martini, Port, Sherry, Vermouth]</i>	Singles							
	Doubles							
	Larger than doubles							
	Glass -Size unspecified							
	Bottles (or parts of e.g. 1/2) [Ask bottle size]							
LIQUEUR	Singles							
	Doubles							
	Larger than doubles							
	Glass -Size unspecified							
	Bottles (or parts of e.g. 1/2) [Ask bottle size]							
PRE-MIXED SPIRITS or ALCOPOPS	Small bottles							
	Large bottles							
COCKTAILS								
OTHER (state quantity and type)	Type:							
	Type:							
	Type:							
	Type:							

NOTES (if required but please complete table immediately after interview):

Monday:

Tuesday:

Wednesday:

Thursday:

Friday:

Saturday:

Sunday:

28. How often have you drank like this **in the last year**? How many weeks a month?

SECTION E: EPISODIC DRINKING

29. In the last year, did you have days when you drank more alcohol than usual?

Yes

No

→ Q33

30. Can you tell me what you usually drank on those days? [Do not show list. Prompt for best guess]

WINE	Glasses	
	Standard bottles (or parts of e.g. 1/2)	
BEER	Pints	
	Litres	
	Regular Bottles	
	Small Bottles	
	Regular cans	
	Small cans	
	Other	
CIDER	Pints	
	Litres	
	Regular Bottles	
	Small Bottles	
	Regular cans	
	Small cans	
	Other	
SPIRITS	Singles or shots	
	Doubles	
	Larger than doubles	
	Glass -Size unspecified	
	Bottles (or parts of e.g. 1/2) [Ask bottle size]	
FORTIFIED WINE [includes Martini, Port, Sherry, Vermouth]	Singles	
	Doubles	
	Larger than doubles	
	Glass -Size unspecified	
	Bottles (or parts of e.g. 1/2) [Ask bottle size]	
LIQUEUR	Singles	
	Doubles	
	Larger than doubles	
	Glass -Size unspecified	
	Bottles (or parts of e.g. 1/2) [Ask bottle size]	
PRE-MIXED SPIRITS or ALCOPOPS	Small bottles	
	Large bottles	
COCKTAILS		
OTHER (state quantity and type)	Type:	
	Type:	
	Type:	
	Type:	

NOTES (if required but please complete table immediately after interview):

31. How often have you drank like this **in the last year**? How many times a month?

32. What was happening when you were drinking more than usual **in the last year**?

33. (Other than those days we have talked about when you have less money),

Did you have days when you drank alcohol, but drank less than usual?

Yes

No

→ Q37

34. Can you tell me what you usually drank on those days? [Do not show list. Prompt for best guess]

WINE	Glasses	
	Standard bottles (or parts of e.g. 1/2)	
BEER	Pints	
	Litres	
	Regular Bottles	
	Small Bottles	
	Regular cans	
	Small cans	
	Other	
CIDER	Pints	
	Litres	
	Regular Bottles	
	Small Bottles	
	Regular cans	
	Small cans	
	Other	
SPIRITS	Singles or shots	
	Doubles	
	Larger than doubles	
	Glass -Size unspecified	
	Bottles (or parts of e.g. 1/2) [Ask bottle size]	
FORTIFIED WINE [includes Martini, Port, Sherry, Vermouth]	Singles	
	Doubles	
	Larger than doubles	
	Glass -Size unspecified	
	Bottles (or parts of e.g. 1/2) [Ask bottle size]	
LIQUEUR	Singles	
	Doubles	
	Larger than doubles	
	Glass -Size unspecified	
	Bottles (or parts of e.g. 1/2) [Ask bottle size]	
PRE-MIXED SPIRITS or ALCOPOPS	Small bottles	
	Large bottles	
COCKTAILS		
OTHER (state quantity and type)	Type:	
	Type:	
	Type:	
	Type:	

NOTES (if required but please complete table immediately after interview):

35. How often have you drank like this **in the last year**? How many times a month?

36. What was happening when you were drinking less alcohol than usual? [PROMPTS IF REQUIRED: religious holiday]

37. In the last 12 months, were there periods when you didn't drink any alcohol at all?
This is outside of normal patterns.

Yes	No
-----	----

THANK,
END

38. How periods have you had like this **in the last year**? How many times a month?

39. We’ve already talked about time in prison, treatment etc, but was there anything else happening around those periods when you weren’t drinking any alcohol?

-----THANK PARTICIPANT, END QUESTIONNAIRE-----