



# **AN EXAMINATION OF PUBLIC ATTITUDES TOWARDS ALCOHOL POLICY**

**NOVEMBER 2016**

## REFERENCE

This report should be referred to as follows:

Buykx P, Li J, Gavens L, Lovatt M, Gomes de Matos E, Holmes J, Hooper L & Meier P (2016) *An examination of public attitudes towards alcohol policy*. University of Sheffield and Cancer Research UK.

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## ACKNOWLEDGEMENTS

We would like to thank the Policy and Information Patient Sounding Board at Cancer Research UK who took part in developing and testing the survey. The authors are solely responsible for the content of the report.

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This research was funded by the Policy Research Centre for Cancer Prevention, Cancer Research UK.



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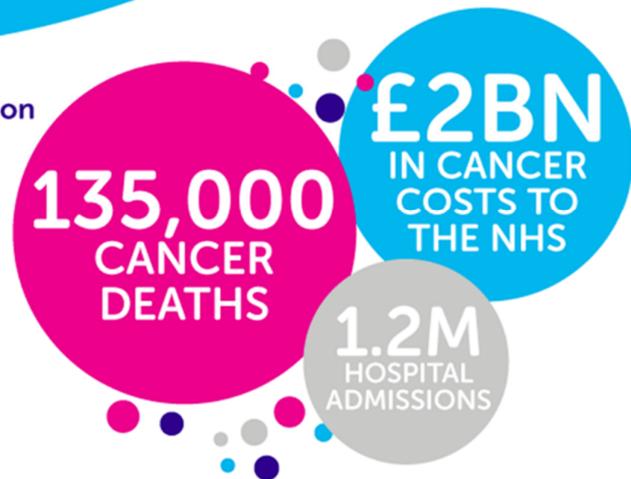
# EXECUTIVE SUMMARY



## IMPACT OF ALCOHOL ON CANCER IN ENGLAND (2015-2035)

If current trends in alcohol consumption continue over the next 20 years, it is estimated it will cause...

Alcohol trends were modelled using a scenario that incorporates both the recent shifts in consumption alongside longer-term trends.



Alcohol consumption is believed to be responsible for approximately 12,800 cancer cases annually in the UK (1) and is linked to seven types of cancer, including two of the most common, breast and bowel (2, 3). If current alcohol consumption trends continued, it will lead to a further 135,000 cancer deaths over the next 20 years and cost £2bn in cancer costs to the NHS(4).

This is the second report following on from Buykx et al., 2015 (5) which explored public knowledge of alcohol as a risk factor for cancer. This report, based on cross-sectional survey data of 2100 people representative of the English adult population, investigates public support of alcohol policies and the link to cancer awareness.

## KEY FINDINGS

- Non-drinkers were the most supportive of all policies (>50% support for alcohol policies).
- Respondents aware of alcohol as a risk factor for cancer were more supportive of policies than those that were not aware of this.

- Alcohol unit labelling for cans and bottles was the most highly supported policy (74%).
- Limiting advertising for alcohol on TV after 9pm was the second most highly supported policy (67%).
- Prevention-based (i.e screening and brief interventions) health service response policies were more supported than treatment-based policies (i.e increasing funding for treatment).
- There was overall support of drink driving counter measure policies.

## POLICY AND PUBLIC HEALTH IMPLICATIONS

This report indicates current levels of support for different policy options is likely to be associated with health knowledge, in particular awareness that alcohol is a risk factor for cancer.

Policy support is also linked to how much a person drinks with those who drink more alcohol being less likely to be supportive of alcohol policies than those who drink less.

# INTRODUCTION

Alcohol is a significant contributor to the global burden of mortality and disease, accounting for 5.9% of deaths and 5.1% of the global burden of disease and injury (as measured by disability adjusted life years) (6). In England, alcohol has been estimated to contribute (either partially or wholly) to mortality and morbidity from 43 different conditions, including heart disease, liver disease, diabetes and seven types of cancer (7) (Figure 1). Alcohol use may also contribute to factors such as obesity and high cholesterol, which also increase the risk of developing an alcohol-related disease.

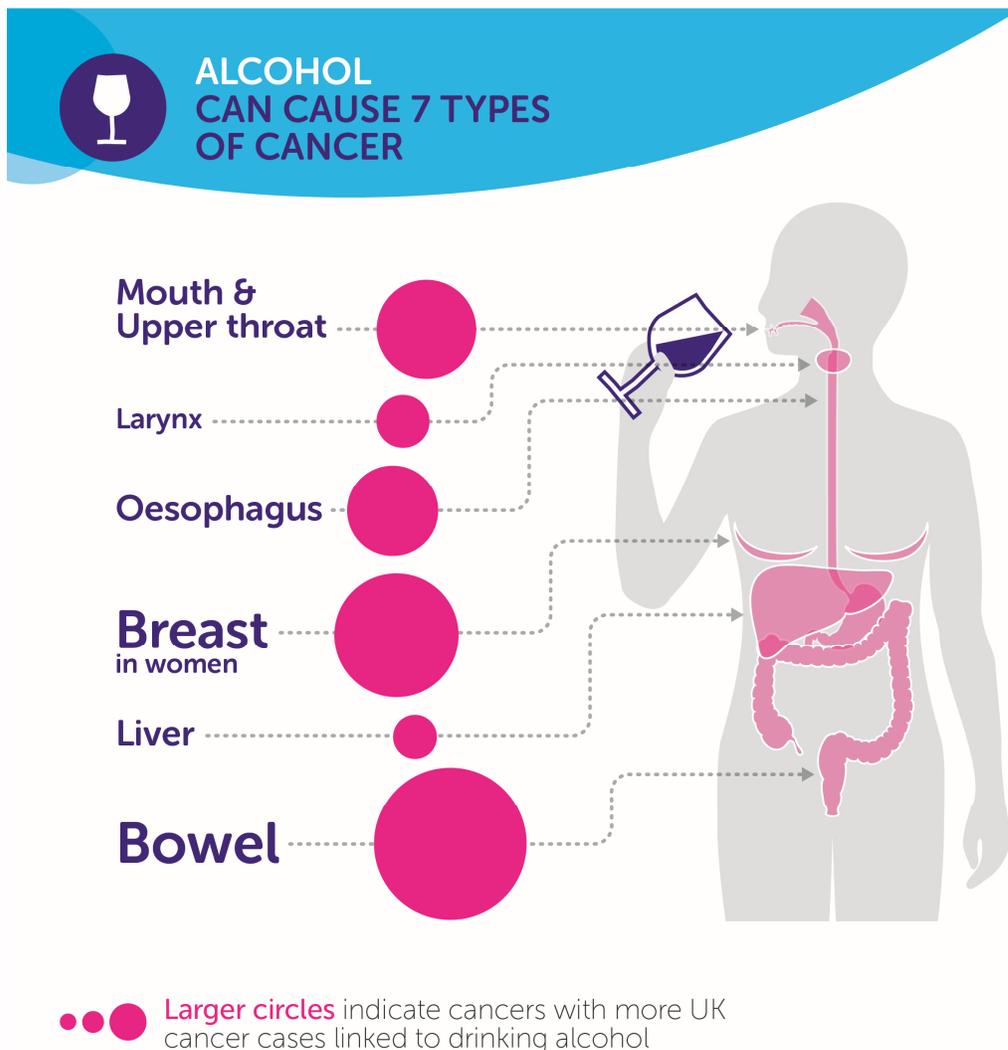


FIGURE 1 CANCER CASES LINKED TO DRINKING ALCOHOL

It is estimated that in 2012, 5.5% of cancer cases and 5.8% of cancer deaths were attributable to alcohol worldwide (3). However, the proportion of cancer attributable to alcohol varies both according to the cancer type and the amount of alcohol consumed (2). For example, while less than 10% of breast cancer cases are attributable to alcohol use, the risk of developing this cancer type among women increases even at low levels of alcohol use ( $\leq 12.5$  g/day, or the equivalent of a glass of wine) (3). If current alcohol consumption trends continued, it will lead to a further 135,000 cancer deaths over the next 20 years and cost £2bn in cancer costs to the NHS(4).

Public health policy to reduce alcohol consumption at a population level may have a positive effect in reducing the burden of alcohol-related disease. There is a strong body of evidence for the relative effectiveness of different alcohol policy options in reducing consumption and harms: the best evidence is for policies which address pricing and availability (4, 8, 9). Broadly speaking, there is an inverse relationship between policy effectiveness and popularity, with higher levels of support for those policies which are considered least effective (10, 11). However, it is possible that the likelihood a person is in favour of alcohol policies is related to their perception of the risk of chronic health harms, especially cancer (12).

There are currently several alcohol policy options under consideration in the UK, such as, Minimum Unit Pricing (MUP) which has been extensively modelled by the University of Sheffield (4, 7), introducing a ban on below cost selling and extending the pre-existing 'Responsibility Deal' with the alcohol industry (13). MUP has been adopted by Scotland (pending the result of a legal challenge) and is also under active consideration by Wales and Northern Ireland. A reduction in the legal drink driving limit from 80 mg to 50 mg alcohol per 100 ml blood (14) and increased investment in alcohol treatment services have also been implemented in Scotland(14).

A key policy focus of the current UK Alcohol Strategy is to "Support individuals to change", through strategies intended to help the public in "Understanding the risks" of alcohol (15, p. 21). This arm of the strategy identified the intention to not only review the drinking guidelines (as mentioned above), but also to improve public health information, potentially by extending current government healthy lifestyle social marketing campaigns to include alcohol. The strategy also promotes "Shared responsibility with industry" which included an undertaking by industry to increase the proportion of products with health labelling to 80% (15, p. 17). There is currently little evidence for the effectiveness of social marketing or health labelling and warning messages in reducing alcohol consumption, although intervening variables such as awareness and intentions may be positively affected (8). However, it can be argued that the public have a right to information about the products they consume and that action in this area is therefore an important part of a comprehensive alcohol strategy.

Policies of this type have already been shown elsewhere to be highly acceptable to the public (10-12, 16), however, it is important to better understand specifically what types of labelling and health messages appeal to the public, including content of such messages (e.g. nutrition labelling, drinking guidelines) (17) and their structure (e.g. positively or negatively framed, specific versus general) (18).

# AIM

The aim of this study was to determine the extent of public support for or opposition to various alcohol policy options intended to reduce alcohol related harm that are either currently implemented or those which could realistically be considered in England.

# METHODS

An online cross-sectional survey was carried out in July 2015. A total sample of 2100 adults completed the survey. Quota sampling ensured the sample were representative of the English general population for gender, age, region and education. A sampling weight was applied to adjust for the under sampling of those without qualifications compared to the general English population. For full details of methods see Buykx et al., 2015(5) and Appendix 1 for source of survey questions.

## DEMOGRAPHIC INFORMATION

Demographic information was sought regarding respondents' age, gender, education, geographical location, and household income. Post code data were used to calculate Index of Multiple Deprivation (IMD) decile.

## ALCOHOL AND TOBACCO USE

Current alcohol use was tested using the 3-item Alcohol Use Disorders Identification Test (AUDIT C) (19). The AUDIT C is a screening tool used to identify potentially hazardous drinkers. Each item is scored from 0 to 4 (total score range 0-12), with a score of zero indicating the person is a current non-drinker, 1-4 indicating lower risk, and 5 or above indicating increasing risk (20). Respondents were asked to specify their current smoking status, the time since they had given up (if applicable) and their use of e-cigarettes.

## KNOWLEDGE AND RISK PERCEPTIONS

Respondents were asked to indicate which, if any, health conditions they thought could result from drinking too much alcohol. This question was first asked unprompted (and respondents asked to complete a free text field) and then asked in relation to seven specific health conditions. To test respondents' risk perceptions concerning alcohol use and specific cancer types, respondents were shown a list of eight different types of cancer and asked whether or not they thought the risk of developing each type of cancer was increased by drinking alcohol. For those cancers they believed to be alcohol-related, respondents were asked to indicate the lowest level of alcohol consumption at which they thought the risk of developing each cancer started to increase. We included cancers which are not known to have any risk from drinking alcohol, those which carry a significant risk from light drinking (e.g. breast cancer), and those which carry a significant risk from heavy drinking (e.g. liver cancer). We developed the questions following discussions with colleagues and Cancer Research UK and drew on existing literature to identify significant and non-significant relationships between alcohol and

particular types of cancer (2).

## ATTITUDES TOWARDS ALCOHOL POLICIES

Respondents' attitudes to various alcohol policies were assessed by asking them to indicate the extent to which they would support or oppose each one after the following prompt: "To reduce the problems associated with excessive alcohol use, to what extent would you support or oppose each of the following policies...?" Responses could be given on a 5 point scale from 'strongly support' to 'strongly oppose', with an additional response option for 'don't know'. The policy domains included items on: Pricing and taxation, Availability, Drink driving counter-measures, Health service responses, Industry responsibility, Labelling, Advertising and marketing. To reduce the risk of order bias the policies were presented in random order for each respondent (see Appendix 2). All analyses presented are based on frequencies recalculated with 'don't know' responses excluded (endorsed by  $\leq 3.1\%$  for all policies).

## REGRESSION ANALYSIS OF VARIABLES ASSOCIATED WITH POLICY SUPPORT

As this work replicates previous research examining the relationship between knowledge of alcohol as a risk factor for cancer and policy support, we replicated the analysis reported in Buykx et al (12). Logistic regression was used to examine the association between support for alcohol policies on the one hand and demographic characteristics (sex [male/female], age [continuous], location [North, Midlands, London/South], education [3 qualification categories], income [8 groups]); alcohol consumption [AUDIT-C score, continuous]; smoking status (current regular or occasional smoker/not); and knowledge of alcohol as a cancer risk factor (yes/no) on the other.

# RESULTS

## DEMOGRAPHICS

The demographic characteristics of the sample are shown in Table 1; 51% were female and the mean age of the sample was 47.8 years (range: 18-80, SD=16.62). All estimates presented in this report are weighted.

TABLE 1 DEMOGRAPHIC CHARACTERISTICS

	N=2100	
	Unweighted n (%)	Weighted n (%)
<b>Gender</b>		
Male	1021 (48.6)	1030 (49.0)
Female	1079 (51.4)	1070 (51.0)
<b>Age</b>		
18-19	63 (3.0)	62 (3.0)
20-29	339 (16.1)	325 (15.5)
30-39	351 (16.7)	332 (15.8)
40-49	394 (18.8)	385 (18.3)
50-59	334 (15.9)	330 (15.7)
60+	619 (29.5)	667 (31.8)
<b>Region of residence</b>		
North	634 (30.2)	643 (30.6)
Midlands	586 (27.9)	586 (27.9)
London/South	880 (41.9)	872 (41.5)
<b>Education</b>		
No qualifications/Don't know	178 (8.5)	315 (15.0)
Below degree level	1238 (59.0)	1155 (55.0)
Degree level or above	684 (32.6)	630 (30.0)
<b>Income (monthly combined household after tax)</b>		
Less than £500	84 (4.0)	95 (4.5)
£500-999	210 (10.0)	226 (10.8)
£1000-1499	303 (14.4)	316 (15.1)
£1500-1999	276 (13.1)	272 (12.9)
£2000-2999	425 (20.2)	404 (19.2)
£3000-3999	228 (10.9)	216 (10.3)
£4000-4999	93 (4.4)	89 (4.2)
£5000+	163 (7.8)	154 (7.4)
I don't know	112 (5.3)	115 (5.5)
Prefer not to say	206 (9.8)	212 (10.1)
<b>Index of Multiple Deprivation quintile group</b>		
Most deprived	461 (22.0)	479 (22.8)
High deprivation	469 (22.3)	474 (22.6)
Average	430 (20.5)	426 (20.3)
Low deprivation	356 (17.0)	350 (16.7)
Least deprived	362 (17.2)	349 (16.6)
Missing*	22 (1.0)	21 (1.0)

\* These data had missing IMD scores because the post-code provided (from which IMD score is derived) is new and not yet included in IMD data

## ALCOHOL AND TOBACCO USE

- The most common frequency of drinking was 2 or 3 times a week, reported by just over a quarter of respondents.
- 1 in 5 reported drinking less than once a month
- 12% reported they ‘never drink’ alcohol
- Of drinkers, 42% reported drinking only one or two units on a typical day when drinking and 1 in 3 reported typically exceeding four units.
- 1 in 3 drinkers reported drinking heavily (>6 units if female, >8units if male) at least once a month.

TABLE 2 SELF-REPORTED ALCOHOL USE: AUDIT C

	N=2100		
	Males (%)	Females (%)	Total (%)
<b>How often do you have a drink containing alcohol?</b>			
Never	9.6	14.1	11.9
Monthly or less	17.9	25.0	21.5
2 to 4 times a month	22.2	24.8	23.5
2 to 3 times a week	29.9	23.9	26.9
4 or more times a week	20.4	12.2	16.2
<b>How many units of alcohol do you drink on a typical day when you are drinking? (if ever drink)*</b>			
1 or 2	33.9	49.6	41.7
3 or 4	25.2	27.5	26.4
5 or 6	18.8	13.3	16.0
7, 8, or 9	11.2	6.0	8.6
10 or more	10.8	3.6	7.2
<b>How often have you had 6 (if female) or 8 (if male) units on a single occasion in the last year? (if ever drink)*</b>			
Never	31.0	39.2	35.1
Less than monthly	31.9	38.2	35.0
Monthly	16.5	11.5	14.1
Weekly	17.0	8.6	12.8
Daily or almost daily	3.6	2.5	3.1
<b>Audit Score (range: 0-12)</b>			
0 (Non-drinkers)	9.6	14.1	11.9
1-4 (Lower risk)	40.0	53.5	46.9
5-12 (Increasing risk)	50.4	32.4	41.2
<b>Mean (SD)</b>	<b>4. 8 (3.18)</b>	<b>3.5 (2.72)</b>	<b>4.1 (3.02)</b>

\*The baseline count ≠ 2100. This is because those who answered ‘Never’ (n=250) to ‘How do often do you have

a drink containing alcohol?’ were counting as missing for these questions. The sample size for both of these questions is 1850.

TABLE 3 SELF-REPORTED SMOKING STATUS

	N=2100		
	Males (%)	Females (%)	Total (%)
<b>Which of the following best describes your smoking status?</b>			
I smoke daily	29.2	22.1	25.5
I smoke occasionally	6.7	5.0	5.9
I don't smoke now but I used to	26.5	23.4	24.9
I've tried it a few times, but never smoked regularly	6.7	8.2	7.5
I've never smoked	30.9	41.3	36.2
<b>How often, if at all, do you currently use an electronic cigarette (e-cigarette)?</b>			
Not at all	73.2	81.3	77.3
Daily	9.4	7.1	8.2
Less than daily but at least once a week	8.6	4.3	6.4
Less than weekly, but at least once a month	3.0	2.9	3.0
Less than monthly	4.5	4.0	4.2
Don't know	1.4	0.5	0.9

## KNOWLEDGE OF HEALTH CONDITIONS LINKED TO ALCHOL

- Unprompted, 12.9% of respondents identified cancer as a potential health outcome of alcohol consumption (Figure 2).

## CANCER AWARENESS

Only around 1 in 10 people linked cancer as a potential health condition resulting from drinking too much alcohol.\*



\*When asked "Which, if any, health conditions do you think can result from drinking too much alcohol?"

Figure 2 Unprompted Cancer Awareness

- When prompted, 47% identified cancer as a potential health outcome and almost 1 in 3 (29%) reported not knowing
- Most respondents correctly identified that drinking too much alcohol can result in liver disease, being overweight or obese, and heart disease (73-95%).

When asked about which specific cancer types are associated with increased drinking:

- Levels of knowledge were highest for liver cancer (80%)
- Less than half of respondents were aware of the cancer link for two cancer types where there is an increased risk at low drinking levels (<50% breast, mouth/throat)
- Levels of knowledge were particularly low for breast cancer (Figure 3).

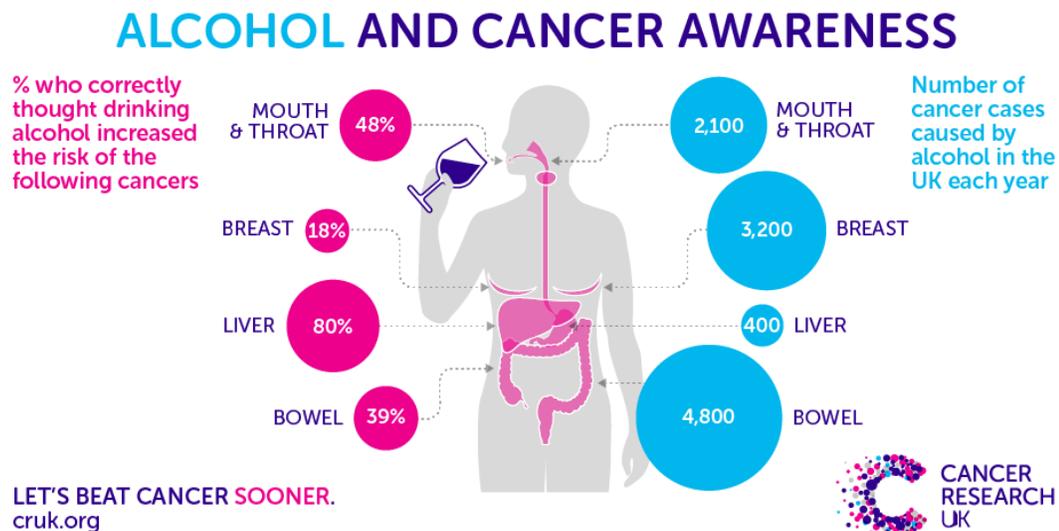


Figure 3 Cancer Type Awareness

## SUPPORT FOR POLICY OPTIONS

When considering those who either 'supported' or 'strongly supported' each policy option (and excluding those who said they 'don't know'):

- The strongest support for policy was for labelling (e.g. number of units on the label).
- Drink driving counter measures were supported by more than half of respondents.
- Levels of support were mixed in some policy domains: for example, availability and advertising and marketing.

- There were low levels of support for policies regarding pricing and restricting the temporal, spatial, and economic availability of alcohol (see Appendix 2).

The relationship between policy support and self-reported alcohol consumption (as measured by AUDIT C categories ‘non-drinker’, lower risk’, and ‘increasing risk’) was also examined (Figure 4 to Figure 10).

- The percentage of respondents indicating ‘Support’ or ‘Strongly support’ for each policy decreased as consumption increased, with the exception increasing funding for alcohol treatment services).

We also examined support for policies by self-reported alcohol consumption with the ‘increasing risk’ drinker group further divided into AUDIT-C score 5-7 and AUDIT-C score 8+ (see Appendix 3).

## AVAILABILITY

Support for restricting the physical availability of alcohol appeared to vary by setting, as well as self-reported alcohol consumption. After policies targeting pricing, reducing trading hours in both on-trade and off-trade settings were among the least popular policy options in all drinker categories, particularly among increasing risk drinkers (Figure 4). A majority of non-drinkers and lower risk drinkers supported banning alcohol consumption on trains and alcohol at school events, whereas support was more divided among increasing risk drinkers.

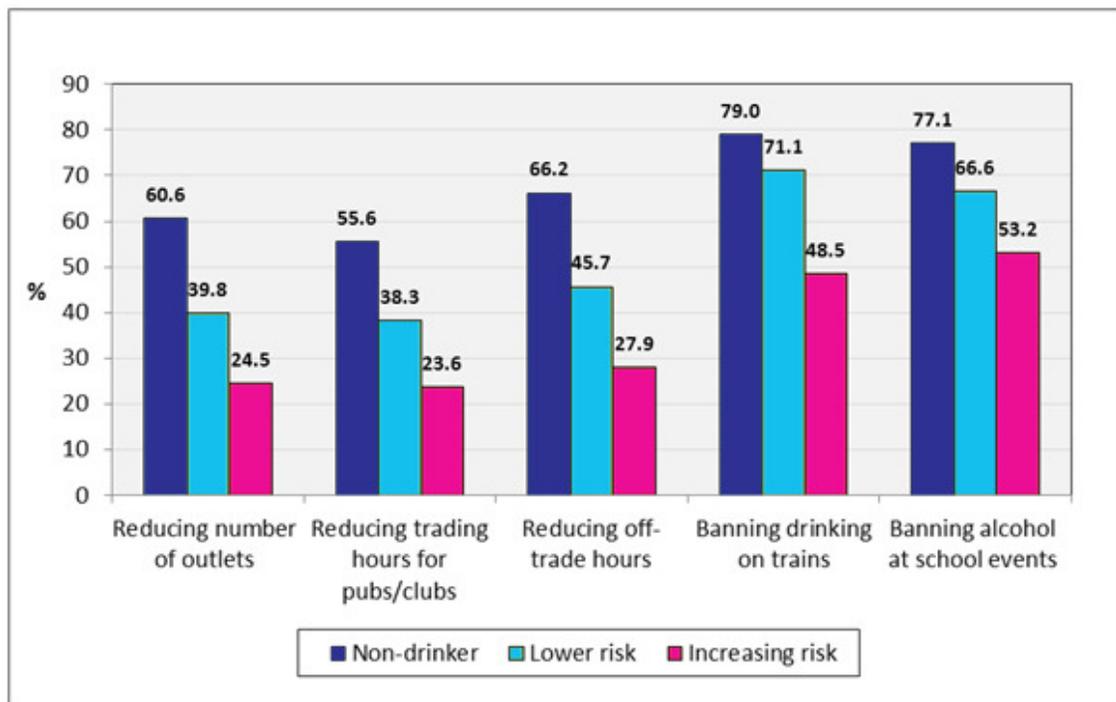


Figure 4 Proportion of respondents who ‘Support’ or ‘Strongly support’ alcohol availability policies by self-reported alcohol consumption

## DRINK DRIVING COUNTER MEASURES

Most non-drinkers supported reducing the drink driving limit and introducing random breath alcohol testing for drivers (Figure 5). Lower risk drinkers also supported these policies, however to a lesser degree. Half of increasing risk drinkers supported reducing the drink driving limit.

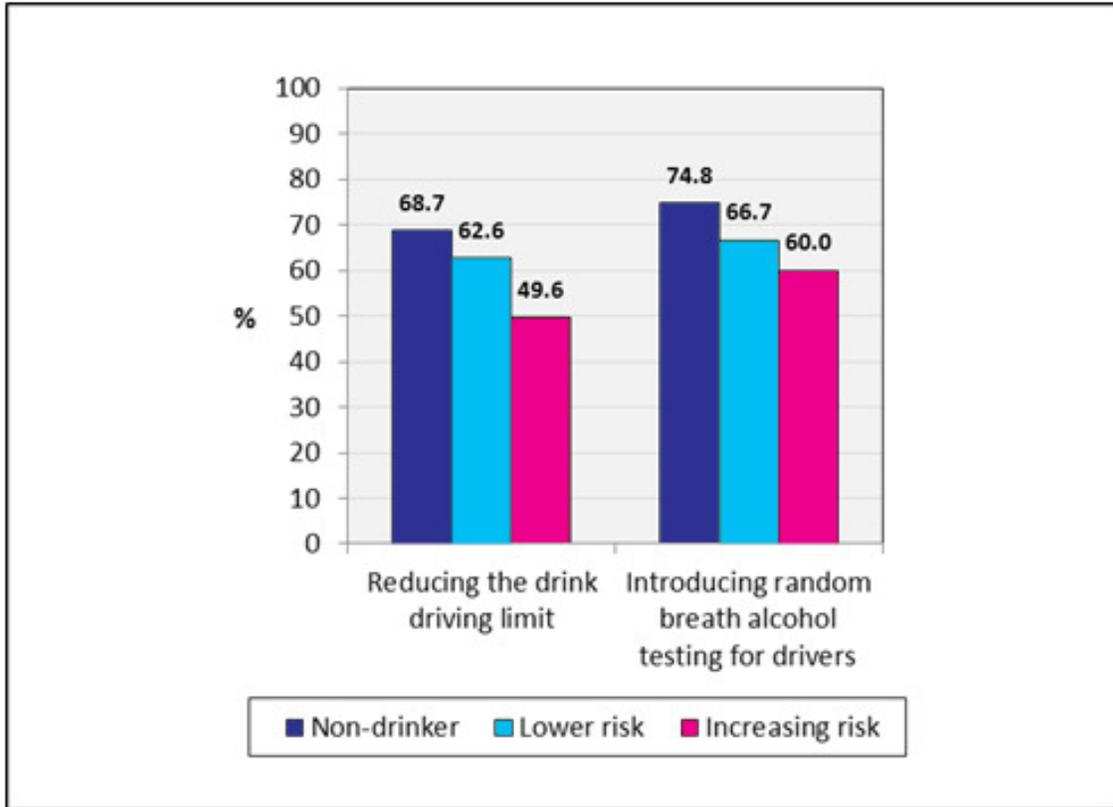


Figure 5 Proportion of respondents who 'Support' or 'Strongly support' drink driving counter measure policies by self-reported alcohol consumption

## HEALTH SERVICE RESPONSE

Compared to the other policies considered, there was less variation between drinker groups in their support for increased funding for alcohol treatment, ranging between 45-52% (Figure 6). Support for doctors or health professionals asking patients about their drinking habits and where necessary offering advice on how to reduce their consumption (hereafter referred to as 'screening and brief interventions') was higher (53-74%).

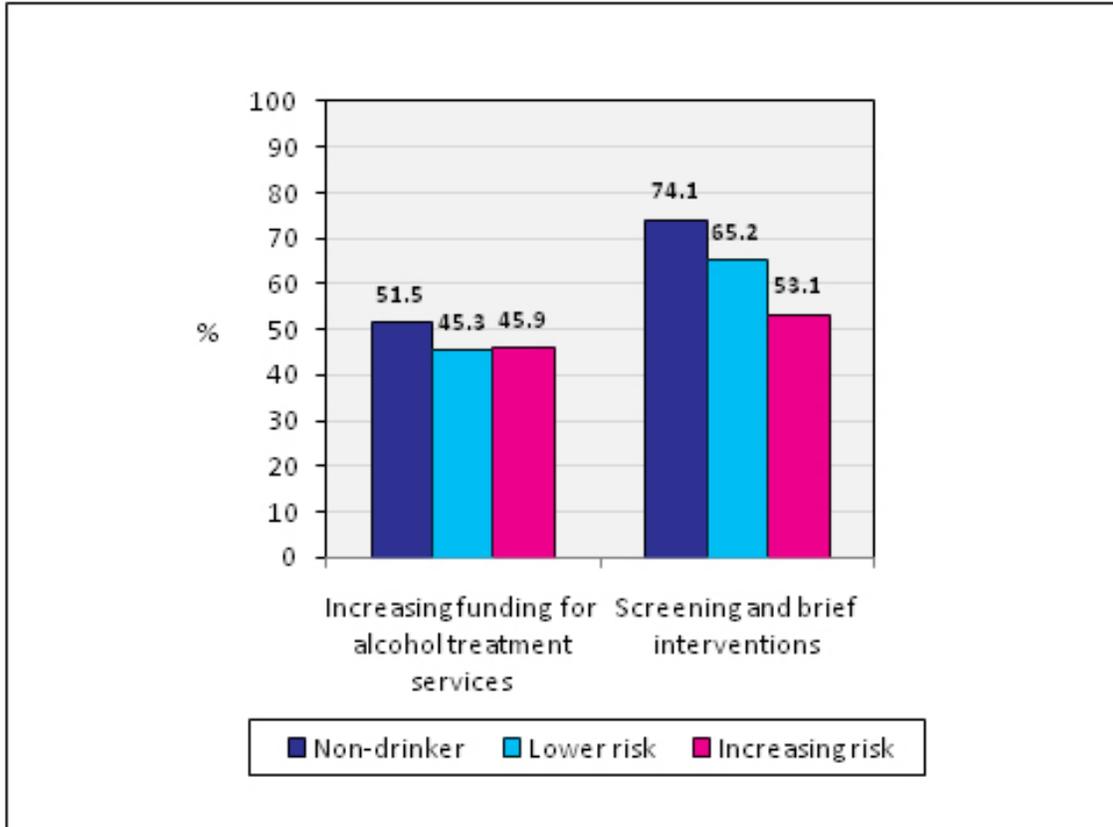


Figure 6 Proportion of respondents who 'Support' or 'Strongly support' health service response policies by self-reported alcohol consumption

## INDUSTRY RESPONSIBILITY

A modest majority of non-drinkers and lower risk drinkers supported the two policies in this domain (i.e. promoting lower strength or smaller portion size products), compared to a lower proportion of increasing risk drinkers (Figure 7).

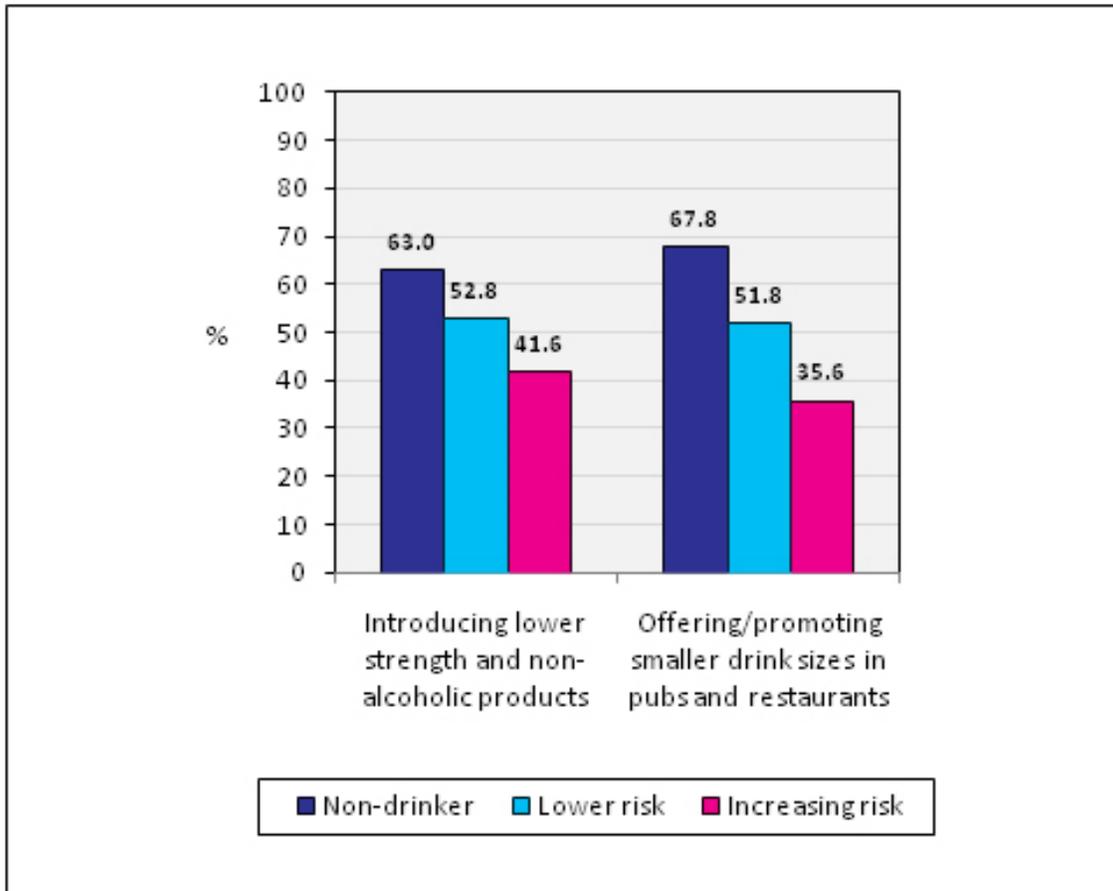


Figure 7 Proportion of respondents who 'Support' or 'Strongly support' industry responsibility policies by self-reported alcohol consumption

## LABELLING

Support for labelling was high across all drinking groups.

- The mandatory inclusion of the number of units in a bottle or a can being shown on the label was highly supported by the majority of all drinking groups (68-80%).
- The majority of non-drinkers (70-75%) supported national guidelines and specific health warnings on alcohol containers, while support was more divided among increasing risk drinkers (51% and 47% respectively) (Figure 8).

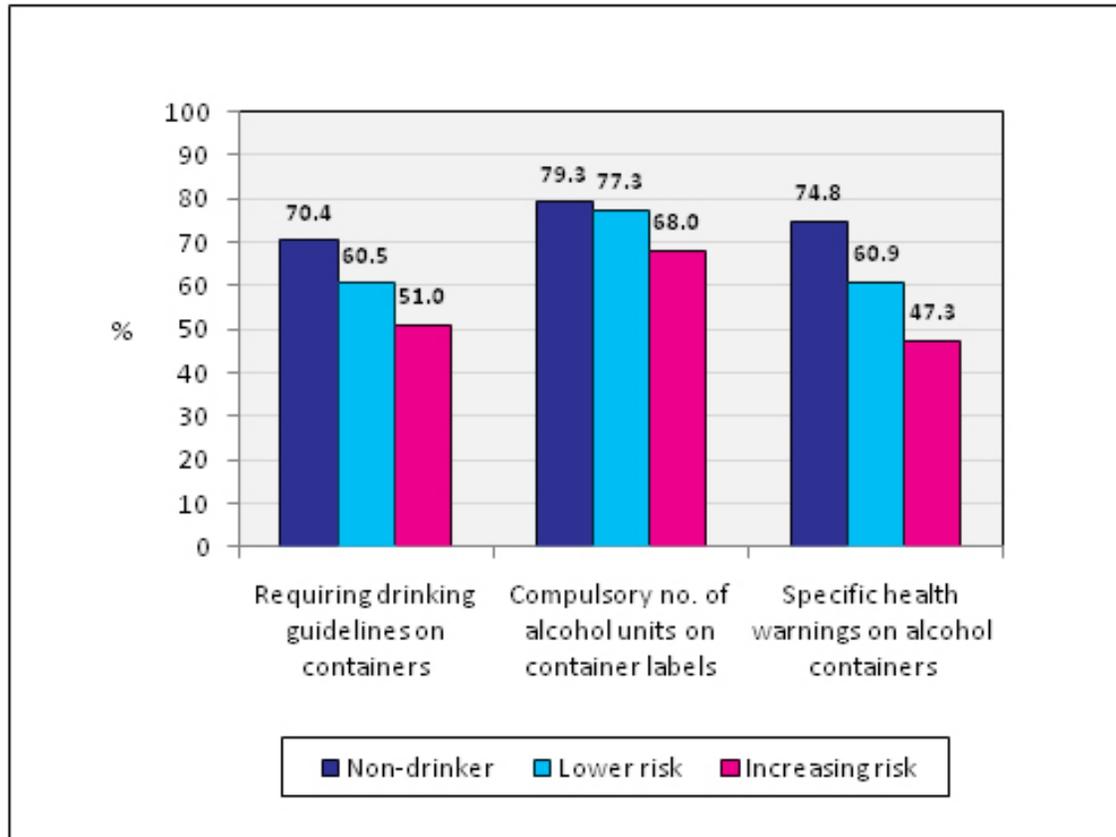


Figure 8 Proportion of respondents who 'Support' or 'Strongly support' labelling policies by self-reported alcohol consumption

## ADVERTISING AND MARKETING

- Limiting TV advertising of alcohol until after 9pm was the most supported policy (Figure 9).
- Support for restricting the display of alcohol in shops and supermarkets to dedicated aisles was similarly high among non-drinkers and lower risk drinkers.
- Respondents were divided on banning alcohol sponsorship of sporting events and banning outdoor alcohol advertising; slightly less than half of lower risk drinkers and only one-third of increasing risk drinkers supported these policies.

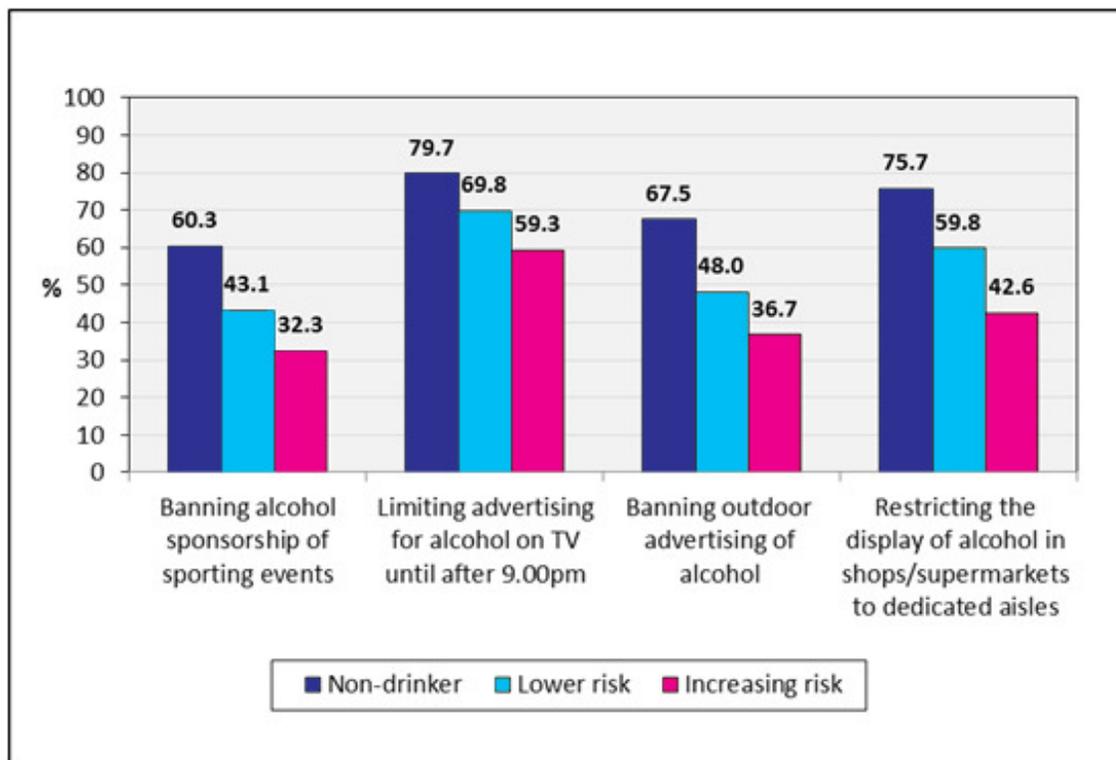


Figure 9 Proportion of respondents who 'Support' or 'Strongly support' advertising and marketing policies by self-reported alcohol consumption

## PRICING

Sixty one percent (60.6%) of non-drinkers were supportive of increasing the price of alcohol compared to only 15.6% of increasing risk drinkers (Figure 10). Levels of support were slightly higher across all drinking groups for volumetric taxation and minimum unit pricing, although still only a minority of lower risk or increasing risk respondents expressed support for either policy.

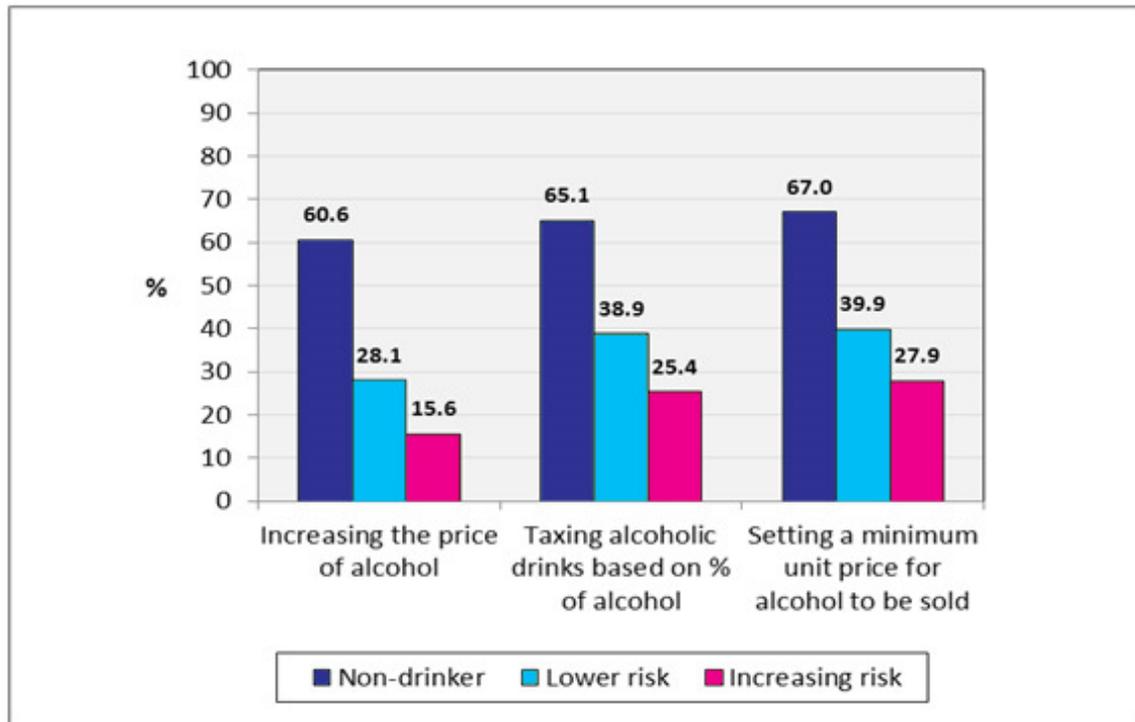


Figure 10 Proportion of respondents who 'Support' or 'Strongly support' alcohol pricing policies by self-reported alcohol consumption

## VARIABLES ASSOCIATED WITH POLICY SUPPORT

To replicate Buykx et al., (21) analysis of the relationship between various predictor variables (demographic characteristics, alcohol consumption as measured by AUDIT-C, smoking status and knowledge of the link between alcohol and cancer) and support for six alcohol policy options was undertaken (see Appendix 4).

The two variables most consistently associated with support for policies were:

1. Knowledge of the link between alcohol and cancer (with those aware of the link more likely to support each policy than those who were not aware)
2. AUDIT-C scores (analysed as a continuous variable with those with increasing scores significantly less likely to support each policy option).

Increasing age was associated with increased likelihood of support for all policies except increasing the price of alcohol and compulsory drinking guideline information to be included on alcohol containers. Females were significantly more likely than men to support banning alcohol sponsorship of sporting events, compulsory drinking guideline information and health warnings on alcohol containers. Those with the highest level of education were significantly more likely to support banning alcohol sponsorship of sporting events, but less likely to support a reduction in the number of alcohol outlets than those without formal educational qualifications.

## DISCUSSION

This report indicates current levels of public support for different alcohol related policy options and has shown that there is an inverse relationship between support for policies and level of alcohol consumed. Also, those that have greater health knowledge, particularly awareness of alcohol as a risk factor for cancer are more supportive of alcohol policies explored in this analysis.

When support for different policies was considered in relation to levels of alcohol consumption (as measured by AUDIT score); non-drinkers were generally the most supportive (>50% for all policies) and those drinking at increasing risk levels the least supportive. Again, this is consistent with previous evidence (10, 11, 22). There are, however, some policy options where the divergence in opinion between non-drinkers and increasing risk drinkers was particularly pronounced; for pricing and taxation policies and reduction in the number of outlets, the difference in the level of support between these groups was more than 35 percentage points. In contrast, for random breath testing and increasing funding for treatment, the difference between groups in the proportion supporting the policy was less than 15%.

For the statements which included additional information (i.e. volumetric taxation and minimum unit pricing), there were marginally higher levels of support. While survey respondents in this study were not provided with full information about the intended goals of policy, this finding is relevant to the argument of Tobin et al., 2011(11) that people are more likely to support policies when their rationale is explained. From our study, it appears even understanding the basis on which alcohol prices could be set is potentially relevant.

With health sector responses, there was greater support for 'prevention' rather than 'cure'. That is, there was greater support for screening and brief intervention (the relevant statement was worded as "*Doctors or health professionals ask patients about their drinking habits and, where necessary, offer advice on how to reduce their alcohol consumption*") in comparison to increased funding for treatment services, which would ordinarily address the needs of people with more serious alcohol related problems. This may be the use of the term 'increased funding' in the item concerning treatment making this option less appealing to some: previous qualitative research on this topic (approximately 90 participants in focus groups in England and Scotland) found some held the view that need for treatment is the responsibility of the individual and/or a waste of resources (23).

Low levels of support were shown for reducing availability of alcohol in venues that were licenced and off-licence retail outlets (<41%). However there were higher levels of support

(greater than 60%) for banning alcohol consumption in settings which might not be considered 'traditional' locations for drinking. We chose to investigate two examples of such settings where alcohol may be available, but where alcohol use might not necessarily be regarded as a usual activity in that environment - trains and schools.

There was also a diversity of opinion about the advertising and marketing related policies. To understand these differences, it would be useful to explore in greater detail what people consider to be the potential positive and negative consequences of each of the policy options. For example, it would be interesting to explore whether people distinguish between alcohol advertising in a specifically timed commercial slot and the showing of alcohol branding as part of a continuous sports broadcast (e.g. hoarding, billboards, logos on clothing and pitches).

Our replication of the analysis reported by Buykx et al.,(12) of the association between support for specific alcohol policies and various predictor variables yielded very similar results. In particular, in this study, we also found knowledge of the link between alcohol and cancer to be a significant predictor of support for policies in all domains, while higher levels of alcohol consumption as measured by AUDIT-C were associated with lower levels of policy support. The analyses undertaken to date include only those policies that were in the study by Buykx et al.,(12)and did not have the more detailed data on cancer knowledge reported in this study. It is our intention that future analyses will incorporate these newly available data.

## **FURTHER WORK**

The first Buykx et al., 2015(5) report provided considerable evidence for the need to raise the public awareness of the links with alcohol and cancer and this report has shown how this could influence the acceptance of key policy interventions. However there remains considerable scope to explore relationships between different elements of the data. Further work has been carried out to explore relationships between different elements of the data, particularly in examining the association between knowledge of the link between alcohol and cancer and levels of support for various policy options. In addition to our replication of findings from previous analysis of Australian data(12), the inclusion of additional variables in this study will allow us to explore other theoretically relevant predictor variables, such as socioeconomic status and perceptions of responsibility for alcohol related harm.

## APPENDICES

### APPENDIX 1 SOURCE OF SURVEY QUESTIONS<sup>1</sup>

Question	Source	Additional notes
<b>Smoking</b>		
5	CCNSW survey , reported in Buykx et al. (12); Australian National Strategy Drug Household Survey (NDSHS) (16)	
7	Brose et al (24)	
<b>Alcohol consumption</b>		
8-10	Audit C (19)	Used UK version of AUDIT (20)
<b>Support for policy**</b>		
Q11 - Question stem	NDSHS (16)	Stem also used in Buykx et al. 2014(12) (i.e. <i>“To reduce the problems associated with excessive alcohol use, to what extent would you support or oppose each of the following policies...?”</i> )
11.1, 11.4, 11.18, 11.14	CCNSW survey , reported in Buykx et al. (12); NDSHS survey (16)	Q11.1 similar statement used in APISE telephone survey, ‘An increase in the price of alcohol’
11.2, 11.19	CCNSW survey , reported in Buykx et al. (12)	
11.5, 11.15	NDSHS survey (16)	Q11.15 changed from ‘9.30pm’ to ‘9.00pm’ to reflect UK TV watershed hour

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<sup>1</sup> Full list of survey questions available on request

11.3, 11.6, 11.9, 11.11, 11.12, 11.16	APISE telephone survey (23)	Q11.3 similar statement used in Ipsos Mori report (25) 'There should be a minimum price on alcohol below which alcohol cannot be sold' Q11.6 changed from 'earlier closing times for buying' to 'reducing hours alcohol can be sold' Q11.12 adapted from 'More treatment services to help dependent drinkers' Q11.16 adapted from 'alcohol advertising on billboards, TV, radio and in magazines and newspapers' to only reflect outdoor advertising
11.10, 11.11, 11.21	APISE focus group study (23)	Q11.10 adapted from 'Introduce more random breath testing for drivers' Q 11.11 changed from 'lower strength drinks' to 'lower strength wine and lower strength or no alcohol beer' to reflect beverage-specific differences Q11.21 Adapted to include brief interventions
11.7, 11.8,11.13, 11.17, 11.20	Devised for this survey	
<b>Knowledge and use of drinking guidelines</b>		
12	ONS Omnibus Survey (26)	Q 12 adapted
13, 14	Devised for this survey	
<b>Knowledge of health conditions associated with alcohol use</b>		
18	CCNSW survey reported in Buykx et al. (12)	Arthritis was added to check the discriminant validity of questions
<b>Knowledge of cancers associated with alcohol use</b>		
19, 20	Devised for this survey, based on reported risk relationship between alcohol and specific cancers (2)	
<b>Support for labelling</b>		

21	Thomson et al (17).	Used 3 items: ABV, units (standard drink) & nutritional labelling
21	Pettigrew et al (18)	Adapted 2 items: 'alcohol can harm your health' and 'alcohol increases your risk of cancer'
<b>Health warning believability, acceptability and persuasiveness</b>		
22	Pettigrew et al (18)	The original study tested the believability of 12 warning statements, of which we chose 6 while maintaining a spread of the message types included: positive or negative framing (e.g. 'reduce intake to reduce risk'), fear appeal or not (e.g. 'alcohol increases your risk of...') and specificity of warning (i.e. general or specific cancer). We devised an additional item regarding the popular belief that drinking in moderation reduces the risk of heart disease
23	Pettigrew et al (18)	As above. The original study tested the 'convincingness' and 'personal relevance' of each item. We instead asked to what extent each warning statement was 'acceptable'
24, 25	Pettigrew et al (18)	Using the same items (and with the addition of one on protective effects) we asked which was the most and which the least persuasive
<b>Responsibility for tackling alcohol-related harm</b>		
26	Devised for this survey	
<b>Personal experience of cancer</b>		
30-31	CCNSW survey reported in Buykx et al. (12)	

\* CCNSW survey = Community Survey on Cancer Prevention conducted by the Cancer Council New South Wales 2013

\*\* Questions 11.1-11.21 are presented in the same order of the original survey (Note a different order of these policies is presented according to policy domains throughout the rest of the report (Figures 1-8, appendix 3).

## APPENDIX 2 PUBLIC SUPPORT OF ALCOHOL POLICIES

To reduce the problems associated with excessive alcohol use, to what extent would you support or oppose each of the following policies?	% (n=2100)						Mean of valid responses		
	Strongly oppose	Oppose	Neither	Support	Strongly support	Don't Know	N	Mean*	SD
<b>Pricing and taxation</b>									
Increasing the price of alcohol	24.2	23.2	24.5	14.8	11.3	2.0	2059	2.7	1.31
Taxing alcoholic drinks on the basis of the percentage of alcohol they contain	17.5	19.8	24.7	21.2	14.1	2.6	2045	3.0	1.31
Setting a minimum unit price below which a unit of alcohol cannot be sold	16.0	17.5	26.6	22.0	14.8	3.1	2034	3.0	1.30
<b>Availability</b>									
Reducing the number of outlets that sell alcohol	13.0	21.1	29.0	19.3	15.8	1.9	2061	3.0	1.26
Reducing trading hours for all pubs and clubs	15.6	23.0	26.0	16.9	16.6	1.9	2060	3.0	1.31
Reducing hours alcohol can be sold within off-licenses and supermarkets	13.5	19.8	24.8	21.3	18.5	2.1	2057	3.1	1.31
Banning alcohol consumption on trains	7.2	9.8	19.7	25.7	35.7	1.9	2061	3.7	1.25
Banning having alcohol available to drink at school events where children are present	5.7	10.3	20.9	27.1	33.9	2.1	2055	3.8	1.20
<b>Drink driving</b>									
Reducing the drink driving limit	11.3	12.3	17.7	24.7	32.0	2.0	2058	3.6	1.36
Introducing random breath alcohol testing for drivers	6.1	9.1	19.3	29.9	33.8	1.8	2062	3.8	1.19
<b>Treatment</b>									
Increasing funding for alcohol treatment services	7.6	12.2	32.5	28.0	17.1	2.6	2045	3.4	1.14
Doctors or health professionals ask patients about their drinking habits and, where necessary, offer advice on how to reduce their alcohol consumption (SBIs)	3.6	6.3	28.2	38.4	21.7	1.8	2062	3.7	1.00

<b>Industry responsibility</b>									
Introducing and promoting lower strength wine and lower strength or no alcohol beer	6.2	10.3	33.1	31.3	17.0	2.2	2054	3.4	1.09
Offering and promoting smaller drink sizes in pubs and restaurants	8.2	12.9	30.8	30.6	15.2	2.3	2051	3.3	1.14
<b>Labelling/health information</b>									
Requiring information on national drinking guidelines on all alcohol containers	3.4	6.1	31.8	34.9	21.3	2.6	2045	3.7	1.00
Making it compulsory that the number of alcohol units in a bottle or can of alcoholic drink be shown on the label	2.7	3.5	19.6	36.8	35.4	2.0	2059	4.0	0.98
Specific health warnings on alcohol containers (e.g. like on tobacco packaging)	4.9	9.4	28.1	32.9	22.8	1.8	2062	3.6	1.10
<b>Advertising &amp; Marketing</b>									
Banning alcohol sponsorship of sporting events	7.9	16.4	33.4	19.1	20.3	2.9	2040	3.3	1.20
Limiting advertising for alcohol on TV until after 9.00pm	3.6	5.6	23.7	35.1	30.4	1.5	2068	3.8	1.04
Banning outdoor advertising of alcohol such as on bill boards and bus stops	5.1	13.8	34.5	23.3	21.4	2.0	2058	3.4	1.13
Restricting the display of alcohol in shops and supermarkets to dedicated aisles (e.g. not in the entrance)	5.8	9.9	28.9	30.6	22.8	1.9	2060	3.6	1.13

APPENDIX 3 PROPORTION OF RESPONDENTS 'SUPPORTING' OR 'STRONGLY SUPPORTING' ALCOHOL POLICIES BY DRINKER GROUP (AUDIT C SCORE)

To reduce the problems associated with excessive alcohol use, to what extent would you support or oppose each of the following policies?	n	Percentage of drinker group supporting policy*			
		No risk (Audit C = 0)	Lower risk (Audit C = 1-4)	Increasing risk 1 (Audit C = 5-7)	Increasing risk 2 (Audit C = 8+)
<b>Pricing and taxation</b>					
Increasing the price of alcohol	2060	60.6	28.1	15.2	16.3
Taxing alcoholic drinks on the basis of the percentage of alcohol they contain	2045	65.1	38.9	24.3	27.6
Setting a minimum unit price below which a unit of alcohol cannot be sold	2035	67.0	39.9	26.3	30.4
<b>Availability</b>					
Reducing the number of outlets that sell alcohol	2060	60.6	39.8	22.2	28.1
Reducing trading hours for all pubs and clubs	2060	55.6	38.3	23.1	24.3
Reducing hours alcohol can be sold within off-licenses and supermarkets	2057	66.2	45.7	26.5	30.5
Banning alcohol consumption on trains	2060	79.0	71.1	51.0	44.3
Banning having alcohol available to drink at school events where children are present	2055	77.1	66.6	54.0	51.9
<b>Drink driving</b>					
Reducing the drink driving limit	2058	68.7	62.6	49.3	50.3
Introducing random breath alcohol testing for drivers	2063	74.8	66.7	60.0	60.0

<b>Treatment</b>					
Increasing funding for alcohol treatment services	2043	51.5	45.3	47.4	43.6
Doctors or health professionals ask patients about their drinking habits and, where necessary, offer advice on how to reduce their alcohol consumption (SBLs)	2061	74.1	65.2	55.1	49.8
<b>Industry responsibility</b>					
Introducing and promoting lower strength wine and lower strength or no alcohol beer	2053	63.0	52.8	43.4	38.6
Offering and promoting smaller drink sizes in pubs and restaurants	2052	67.8	51.8	37.9	31.9
<b>Labelling/health information</b>					
Requiring information on national drinking guidelines on all alcohol containers	2045	70.4	60.5	52.5	48.6
Making it compulsory that the number of alcohol units in a bottle or can of alcoholic drink be shown on the label	2059	79.3	77.3	71.6	62.0
Specific health warnings on alcohol containers (e.g. like on tobacco packaging)	2062	74.8	60.9	47.6	46.6
<b>Advertising &amp; Marketing</b>					
Banning alcohol sponsorship of sporting events	2040	60.3	43.1	32.8	31.7
Limiting advertising for alcohol on TV until after 9.00pm	2069	79.7	69.8	62.0	54.7
Banning outdoor advertising of alcohol such as on bill boards and bus stops	2057	67.5	48.0	37.8	35.2
Restricting the display of alcohol in shops and supermarkets to dedicated aisles (e.g. not in the entrance)	2060	75.7	59.8	43.0	41.8

\* 'Strongly support' or 'Support' and excluding 'Don't know'.

### APPENDIX 4 ODDS RATIOS (95% CONFIDENCE INTERVALS) OF SUPPORT FOR POLICY

Predictor variables	Pricing		Availability		Marketing		Labelling					
	Increasing the Price of alcohol (N=2061)		Taxing alcohol based on ABV (N=2048)		Reducing number of outlets (N=2062)		Banning sponsorship of sporting events (N=2044)		Requiring guidelines on containers (N=2050)		Specific health warnings on containers (N=2068)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<b>Sex</b>												
Male	1		1		1		1.00		1		1	
Female	1.02	0.826-1.261	0.982	0.808- 1.195	1.118	0.921- 1.357	1.52‡	1.256-1.832	1.67‡	1.386- 2.011	1.359‡	1.128- 1.636
<b>Age</b> (per year increase)	0.998	0.991-1.00	1.01‡	1.004-1.017	1.012‡	1.006- 1.018	1.01†	1.002- 1.014	1	0.994- 1.006	1.008†	1.002- 1.014
<b>Location</b>												
North	1		1		1		1.00		1		1	
Midlands	1.062	0.808-1.395	1.327*	1.034-1.703	1.063	0.831- 1.361	1.01	0.792- 1.28	0.933	0.736- 1.183	0.858	0.677- 1.087
London/South	1.057	0.824- 1.355	1.065	0.846- 1.339	0.991	0.790- 1.244	0.94	0.754- 1.169	1.002	0.808- 1.244	0.878	0.708- 1.090
<b>Educational qualification</b>												
None/don't know	1		1		1		1.00		1		1	
Below degree level	0.838	0.613- 1.145	1.109	0.824- 1.494	0.61‡	0.459- 0.810	1.04	0.783- 1.388	1.126	0.847- 1.496	0.829	0.623- 1.103
Degree or above	1.143	0.803- 1.628	1.756‡	1.255- 2.457	0.667*	0.483- 0.923	1.49*	1.076- 2.057	1.367	0.990- 1.889	1.093	0.790- 1.512
<b>Income</b>												
<£500	1		1		1		1.00		1		1	
£500-999	1.486	0.834- 2.645	1.236	0.717- 2.129	0.926	0.550- 1.557	1.08	0.646- 1.805	1.068	0.645- 1.769	1.139	0.683- 1.897
£1000-1499	1.388	0.796- 2.420	1.28	0.760- 2.159	0.928	0.563- 1.529	1.06	0.647- 1.739	1.299	0.800- 2.11	1.186	0.727- 1.933
£1500-1999	0.891	0.496- 1.600	1.034	0.602- 1.776	0.736	0.437- 1.238	0.92	0.556- 1.536	1.177	0.716- 1.934	1.004	0.609- 1.654
£2000-2999	1.082	0.619- 1.890	1.074	0.639- 1.808	0.792	0.481- 1.305	0.70	0.43- 1.151	0.997	0.617- 1.611	0.878	0.542- 1.423
£3000-3999	1.249	0.687- 2.271	1.452	0.835- 2.524	0.801	0.467- 1.371	0.64	0.373- 1.081	1.011	0.604- 1.695	0.966	0.575- 1.622
£4000-4999	1.061	0.510- 2.209	1.109	0.575- 2.139	0.902	0.477- 1.708	0.74	0.392- 1.385	0.744	0.405- 1.368	0.736	0.399- 1.357
£5000+	2.268†	1.228- 4.187	1.72	0.959- 3.083	1.261	0.719- 2.210	1.09	0.627- 1.903	1.173	0.677- 2.030	1.184	0.683- 2.054
I don't know	0.714	0.356- 1.432	0.935	0.494- 1.769	0.347†	0.179- 0.673	0.66	0.361- 1.888	1.308	0.723- 2.367	1.164	0.650- 2.084
I prefer not to say	1.126	0.625- 2.028	0.999	0.574- 1.739	0.882	0.520- 1.495	0.91	0.541- 1.538	0.649	0.389- 1.084	0.721	0.430- 1.207
<b>Audit C score</b> (per point)	0.784‡	0.752- 0.818	0.831‡	0.801- 0.862	0.862‡	0.832- 0.893	0.91‡	0.877- 0.937	0.916†	0.887- 0.946	0.893‡	0.864- 0.922
<b>Smoker</b>												
No	1		1		1		1.00		1		1	
Yes	1.144	0.890- 1.471	0.869	0.688- 1.096	1.172	0.933- 1.473	0.90	0.722- 1.124	0.931	0.751- 1.153	0.968	0.782- 1.199
<b>Cancer knowledge</b>												
No/don't know	1		1		1		1.00		1		1	
Yes	1.444‡	1.173- 1.777	1.674‡	1.381- 2.028	1.435‡	1.186- 1.737	1.52‡	1.265- 1.831	1.293†	1.076- 1.553	1.31‡	1.091- 1.572

\* p < 0.05; † p < 0.01; ‡ p < 0.001

# REFERENCES

1. Parkin DM. 3. Cancers attributable to consumption of alcohol in the UK in 2010. *British Journal of Cancer*. 2011;105(Suppl 2):S14-S8.
2. Bagnardi V, Rota M, Botteri E, Tramacere I, Islami F, Fedirko V, et al. Alcohol consumption and site-specific cancer risk: a comprehensive dose–response meta-analysis. *British Journal of Cancer*. 2014.
3. Praud D, Rota M, Rehm J, Shield K, Zatoński W, Hashibe M, et al. Cancer incidence and mortality attributable to alcohol consumption. *International Journal of Cancer*. 2015:n/a-n/a.
4. Angus C, Holmes J, Pryce R, Meier P, Brennan A. Alcohol and cancer trends: *Intervention Studies*. University of Sheffield and Cancer Research UK, 2016.
5. Buykx P LJ, Gavens L, Lovatt M, Gomes de Matos E, Holmes J, Hooper L & Meier P. An investigation of public knowledge of the link between alcohol and cancer. University of Sheffield and Cancer Research UK, 2015.
6. WHO. Global status report on alcohol and health. World Health Organization, 2014 9240692762.
7. Holmes J, Meng Y, Meier PS, Brennan A, Angus C, Campbell-Burton CA, et al. Effects of minimum unit pricing for alcohol on different income and socioeconomic groups: a modelling study. *Lancet*. 2014;383(9929):1655-64.
8. Babor TF, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, et al. Alcohol: No ordinary commodity. Research and public policy. 2nd ed. Oxford: Oxford University Press; 2010 2010.
9. Health First: an evidence-based alcohol strategy for the UK. 2013.
10. Diepeveen S, Ling T, Suhrcke M, Roland M, Marteau T. Public acceptability of government intervention to change health-related behaviours: a systematic review and narrative synthesis. *BMC Public Health*. 2013;13(1):756.
11. Tobin C, Moodie AR, Livingstone C. A review of public opinion towards alcohol controls in Australia. *BMC Public Health*. 2011;11(1):58.
12. Buykx P. GC, Ward B., Kippen R., Chapman K. . Public support for alcohol policies associated with knowledge of cancer risk. *International Journal of Drug Policy*. 2014.
13. Gornall J. Under the influence. *British Medical Journal*. 2014;348(f7646).
14. NHS Health Scotland. Assessing the availability of and need for specialist alcohol treatment services in Scotland Edinburgh: NHS Scotland; 2014. Available from: <http://news.scotland.gov.uk/News/Lower-drink-drive-limit-12f8.aspx>.
15. HM Government. The Government's Alcohol Strategy. London: 2012 2012. Report No.: Cm 8336.
16. Australian Institute of Health and Welfare. 2010 National Drug Strategy Household Survey Report. 2011 PHE 145; 323pp.
17. Thomson LM, Vandenberg B, Fitzgerald JF. An exploratory study of drinkers views of health information and warning labels on alcohol containers. *Drug and Alcohol Review*. 2012;31:240-7.
18. Pettigrew S, Jogenelis M, Chikritzhs T, Slevin T, Pratt IS, Glance D, et al. Developing cancer warning statements for alcoholic beverages. *BMC Public Health*. 2014;14(786):1-10.
19. Bush K, Kivlahan D, McDonnell M, Fihn S, Bradley K. The AUDIT alcohol consumption questions (AUDIT-C): An effective brief screening test for problem drinking. *JAMA Internal Medicine*. 1998;158(16):1789-95.

20. Alcohol Learning Centre. Short AUDIT Questionnaire – AUDIT-C 2009 [05.10.15]. Available from:  
[http://www.alcohollearningcentre.org.uk/alcoholLearning/learning/IBA/Module3\\_v3/D/ALC\\_Session/256/tab\\_645.html](http://www.alcohollearningcentre.org.uk/alcoholLearning/learning/IBA/Module3_v3/D/ALC_Session/256/tab_645.html).
21. Buykx P, Gilligan C, Ward B, Kippen R, Chapman K. Public support for alcohol policies associated with knowledge of cancer risk. *Int J Drug Policy*. 2015;26(4):371-9.
22. Australian Institute of Health Welfare. 2010 National drug strategy household survey report: Australian Institute of Health and Welfare; 2010.
23. Li J, Lovatt, M., Eadie, D., Dobbie, F. Petra, M., Holmes, J., Hastings, G., Anne Marie MacKintosh. Public attitudes towards alcohol control policies in Scotland and England: Results from a mixed-methods study. Under review.
24. Brose LS, Hitchman SC, Brown J, West R, McNeill A. Is the use of electronic cigarettes while smoking associated with smoking cessation attempts, cessation and reduced cigarette consumption? A survey with a 1-year follow-up. *Addiction*. 2015;110(7):1160-8.
25. Ipsos MORI. Alcohol: Public Knowledge, Attitudes and Behaviours. Dublin: Health Research Board, 2012.
26. Office for National Statistics. Opinions Survey Report No. 42 Drinking: adults' behaviour and knowledge in 2009. 2010.