

New national alcohol guidelines in the UK: public awareness, understanding and behavioural intentions

Gillian Rosenberg¹, Linda Bauld², Lucie Hooper¹, Penny Buykx³, John Holmes³, Jyotsna Vohra¹

¹Policy Research Centre for Cancer Prevention (PRCP), Cancer Research UK, Angel Building, 407 St. John Street, London EC1V 4AD, UK

²CRUK/BUPA Chair in Behavioural Research for Cancer Prevention Institute for Social Marketing, 3Y1, University of Stirling, Stirling, FK9 4LA, UK

³Sheffield Alcohol Research Group, School of Health and Related Research (ScHARR), University of Sheffield, Sheffield, UK

Address correspondence to Gillian Rosenberg, E-mail: gillian.rosenberg@cancer.org.uk

ABSTRACT

Background Alcohol consumption places a significant burden on the NHS and is an important risk factor for cancer, associated with 12 800 UK cases/year. New alcohol guidelines were published in 2016, taking into account the increasing evidence of the health harms of alcohol.

Methods A survey of the UK drinker population ($n = 972$) was conducted 1 week before and 1 month after the release of the guidelines to capture drinking habits, guideline awareness and intended behaviour change.

Results Overall, 71% were aware of the new alcohol guidelines, however, just 8% knew what the recommended limits were. Higher socioeconomic groups were more likely to know these limits (ABC1 = 9% versus C2DE = 4%, $P = 0.009$). Participants who recognized the message that alcohol causes cancer were more likely to correctly identify the new guidelines (message recognition = 12% versus no recognition = 6%, $P = 0.004$); and were more likely to self-report an intention to reduce their alcohol consumption (message recognition = 10% versus no recognition = 6%, $P = 0.01$).

Conclusion The majority of the population knew the guidelines had been updated, however, communication of the new limits needs to be improved. Raising awareness of the links between alcohol and cancer may improve understanding of alcohol guidelines and could prompt behaviour change for those motivated to reduce their alcohol consumption.

Keywords alcohol consumption, cancer, socioeconomics factors

Introduction

Globally, alcohol accounts for 5.9% of deaths and 5.1% of disability-adjusted life years, and is linked to over 200 health conditions, including, heart disease, stroke, diabetes¹ and seven types of cancer.² Those from lower socioeconomic groups consume the least amount of alcohol,³ however, prevalence rates for disease and mortality due to alcohol harm is highest in these groups,⁴ often because of clustering of other health behaviours (smoking, poor diet and excess weight) and heavy episodic drinking.⁵ Between 2012 and 2013 in the UK, alcohol was responsible for over 330 000 hospital admissions, as estimated from attributable fractions, with 21% of these were due to cancer.⁶ In 2012 it was estimated that alcohol causes 5.5% of cancer cases and 5.8% cancer deaths in the UK. However, previous research has

shown there to be poor public awareness of alcohol as a risk factor for cancer.^{7,8} The latest research in England found only 13% of the adult population knew alcohol consumption increases the risk of cancer when asked an unprompted question.⁹

Guidelines on low risk drinking exist in at least 37 countries.¹⁰ In the UK prior to 2016, these guidelines were last revised in 1995 where there was a shift from a weekly to a daily guideline. The 1995 guidance stated that men should

Gillian Rosenberg, Senior Researcher

Linda Bauld, Professor of Health Policy

Lucie Hooper, Researcher

Penny Buykx, Senior Research Fellow

John Holmes, Senior Research Fellow

Jyotsna Vohra, Head of Policy Research Centre for Cancer Prevention (PRCP)

not exceed 3–4 units per day; women should not exceed 2–3 units per day and to allow an alcohol-free 48 h period following a heavy drinking session to allow tissue to recover.¹¹

The latest national Alcohol Strategy (2012) emphasized the need to support people in making healthier choices. A mechanism for achieving this included a review of lower risk drinking guidelines by the four UK Chief Medical Officers (CMO) from England, Wales, Scotland and Northern Ireland.¹² The rationale behind the new guidelines was that everybody has a right to accurate information regarding health risks associated with alcohol consumption and it is the government's responsibility to provide such information so the public can make informed choices about their drinking.¹³

An expert group reviewed all of the evidence since the last guidelines were updated in 1995. The group considered both long-term health risks (e.g. cases and mortality for diseases such as heart disease, stroke and cancer) and short-term health impacts (e.g. deaths caused by accidents and injuries).

The new guidelines recommend:¹³

- Men and women who drink regularly are safest not to drink more than 14 units per week.
- It is best to spread the 14 units over a period of 3 days or more.
- The safest approach for women who are pregnant is not to drink at all.

In addition to the recommendations, several health messages are included within the guidelines document,¹³ for example:

- Alcohol guidelines do not represent an absolutely safe amount to drink; they are intended to keep a person's health risks from alcohol to a minimum.
- The risk associated with regularly drinking 14 units per week is similar to the harms of other routine activities, such as driving a car.
- If you wish to cut down the amount you're drinking, a good way to achieve this is to have several drink-free days a week.
- Drinking alcohol regularly is linked to long-term risks such as cancer.

The publication of the new CMO alcohol guidelines on 6 January 2016 attracted media coverage in the UK and elsewhere. The message that drinking any amount of alcohol increases the risk of cancer generated widespread discussion. There has been no national campaign to promote the new guidelines, however, a consultation was held to discuss how the messaging of the guidelines should best be communicated.

Internationally, previous research has shown that knowledge of low risk drinking guidelines and the health harms of

alcohol is low.^{14–16} The limited evidence on the impact of the promotion of alcohol guidelines in different countries suggests that while they may raise awareness and knowledge of the recommended drinking limits, communicating guidelines does not in and of itself reduce alcohol consumption.^{17–20}

The aim of this study was to investigate awareness of the revised UK lower risk drinking guidelines amongst adults in the UK who consume alcohol; the accompanying health messaging; and how these are associated with intentions regarding future drinking behaviour.

Methods

Data came from two surveys for which data were collected 2 weeks before and 1 month after the revised guidelines. Although the same individuals were surveyed at both time points, different questions were used in the two surveys so longitudinal analyses was not possible. Instead, the data were analysed cross-sectionally and only those responding to both surveys were included in the analysis.

Sampling

Data collection was carried out via a self-administered online survey in two waves by YouGov, a market research company. The sample population was recruited by YouGov from their online panel, a base sample from across the UK. Automated sampling with regional quotas for England, Wales, Scotland and Northern Ireland was applied to ensure a generally representative sample of the UK population. Participants were invited by email to fill in the questionnaire online. The population of interest for this study was adults in the UK who drank alcohol as this was the target group for the alcohol guidelines. As such, participants were screened using the question 'Do you ever drink alcohol nowadays, including drinks you brew or make at home?' to exclude non-drinkers. In total, 1197 participants were sampled at baseline and of these, the 972 respondents who participated at follow up (retention rate = 81%) form the analytical sample here. There were no differences in retention rates by age, gender, social grade or geographic location.

Measures

The survey tool was based on previous research.⁹ Additional items were incorporated from other survey tools and adapted where necessary to be relevant to the new alcohol guidelines. Where no existing tools could be found, new questions were developed and tested using a patient panel group for clarity, content and style of questions.

In the baseline survey demographic information (gender, age, education, geographical location and household income)

and typical alcohol use were collected. Where complete data were available, the National Readership Survey (NRS) system was used to group the respondents into two social grades: ABC1 (higher, intermediate, supervisory, clerical and junior managerial, administrative and professional occupations) and C2DE (skilled, semi-skilled and unskilled manual occupations, unemployed and lowest grade occupations). Typical alcohol use was tested using the 3-item short-form of the Alcohol Use Disorders Identification Test (AUDIT-C).²¹ Where complete data were available, two drinker categories were created: lower risk (AUDIT-C score = 1–4); and increasing risk (AUDIT-C score = 5+).

In the second wave, the same respondents were asked about awareness of the new alcohol guidelines, their views regarding health messaging (i.e. links between alcohol and cancer) surrounding the guidelines and any intended behaviour change. Wording of the health messages were taken directly from the publicity from the CMO surrounding the release of the guidelines. See Supplementary information for full survey details. Participants were asked if they were aware of the new guidelines with a Yes/No question. Knowledge of the guidelines was assessed by first asking whether the guidelines had a weekly or a daily limit, followed by the specific limit, in units, recommended for women and then for men. Governmental responsibility was recorded using a 5-point Likert scale from strong agreement to strong disagreement. Message recognition was assessed using the question 'Do you recall hearing any of the following messages...'. Health message agreement was recorded using a 5-point Likert scale from strong agreement to strong disagreement. These questions were asked to all respondents, with wording of the questions altered where required for those who were and were not aware of the new drinking guidelines (see Supplementary information for more detail).

To investigate intended behaviour change due to the new guidelines, the following question were asked to those who were aware of the new guidelines. Intended guideline use was recorded using a 5-point Likert scale of from always to never. Intention to change drinking habits was recorded using the question 'Which of the following best describes you?: I am planning to cut down my drinking following the release of the new alcohol guidelines; I think I should cut down my drinking following the release of the new alcohol guidelines but I probably won't; I am not planning to cut down my drinking following the release of the new alcohol guidelines.' A don't know option was included in these questions, and those answering don't know were excluded from the analysis.

Data analysis

Data were analysed using Stata[®] Statistical Software: Release 13.1 (StataCorp, College Station, TX, USA). Sample weights

were applied to gender, region and age to adjust for the under sampling of males and older people relative to the UK alcohol drinking population. Results are displayed using weighted data are presented, unless specified. Univariate binary logistic regression was used to explore factors associated with guideline awareness and guideline knowledge. Univariate ordinal logistic regression was used to explore factors associated with governmental responsibility and intended behaviour change. Significant factors were then entered into a multi-variable logistic regression, with step-wise elimination of non-significant variables to determine independent predictors. The association of guideline awareness and message recognition was analysed using chi squared tests.

Results

Sample characteristics can be seen in Table 1. There was complete information from 918/972 participants to characterize their drinking risk levels using the AUDIT-C tool. Within this sub-sample, just under half (46%) were classified as 'increasing risk' drinkers, with the rest as 'low risk'.

Nearly three quarters (71%) of the sample were aware that there were new alcohol guidelines one month after they had been released. However, knowledge of the recommended drinking limits in the new guidelines (14 units per week for men and women) across the UK drinking population was very low (8%). Knowledge of the general themes of the new guidelines were also low. Even for those who were aware that there were new guidelines, only 30% knew that the guidelines had a weekly and not a daily limit; 35% knew that the guidelines had the same limit for men and women; whilst 41% knew the limit for men was now below 21 units per week (data not shown).

Nearly two-thirds (63%) of people surveyed strongly agreed or agreed that the government has a responsibility to release this guidance on how drinkers can minimize health risks. The most recognized health messages that surrounded the release of the new guidelines were that there is no safe limit for drinking (42%) and that alcohol is linked to cancer (24%). Only 7% of respondents were intending to reduce their alcohol consumption following the release of the new alcohol guidelines, whilst one-third (33%) planned to always, often or sometimes use the new guidelines to keep track of their own drinking.

Predictors of guideline awareness, knowledge and attitudes

Greater awareness of the new guidelines was independently associated with being male, older and from a higher socioeconomic background (Table 2). The most common place that people encountered the new guidelines during the

Table 1 Summary profile of the sample population

		<i>Unweighted</i>		<i>Weighted</i>	
		<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Gender (<i>n</i> = 972)	Male	364	37	493	51
	Female	608	63	479	49
Age (<i>n</i> = 972)	18–25	162	17	146	15
	26–35	245	25	184	19
	36–45	285	29	237	24
	46–55	205	21	293	30
	56+	75	8	112	12
Social grade (<i>n</i> = 930)	ABC1	651	70	657	70
	C2DE	279	30	279	30
Region (<i>n</i> = 972)	England	826	85	814	84
	Scotland	76	8	82	8
	Wales	52	5	48	5
	Northern Ireland	18	2	28	3
AUDIT-C (<i>n</i> = 918)	Non-drinker	0	0	0	0
	Low risk	528	58	497	54
	Increasing risk	390	42	422	46
Aware of new guidelines (<i>n</i> = 972)	Yes	654	67	690	71
	No	318	33	282	29
Correct knowledge drinking limits (<i>n</i> = 972)	Yes	64	7	78	8
	No	908	93	894	92
Government responsibility to release guidelines (<i>n</i> = 972)	Strongly agree/agree	639	66	612	63
	Strongly disagree/disagree	88	9	107	11
	Neither/don't know	245	25	253	26
Recognition of no safe limit message (<i>n</i> = 972)	Yes	385	40	408	42
	No	587	60	564	58
Recognition of cancer message (<i>n</i> = 972)	Yes	231	24	233	24
	No	741	76	739	76
Intention to change drinking habits (<i>n</i> = 579)	Planning on cutting down	39	7	41	7
	Should cut down but probably wont	65	11	69	12
	Not planning on cutting down	467	81	469	81
Intention to use guidelines to keep track of drinking (<i>n</i> = 607)	Always/often/sometimes	213	35	200	33
	Rarely/never	394	65	407	67

month of January were on TV or the radio (73%) followed by in print media (29%) and then online (15%). Only 4% had come across the new guidelines in a healthcare setting (data not shown). Correct knowledge of the guidelines was approximately double in men versus women, ABC1 versus C2DE and increasing risk versus low risk drinkers (Table 2). Multivariate analysis revealed that socioeconomic background and recognition of the message that alcohol is linked to cancer were independent predictors of correct guideline knowledge.

Agreement that the government should be releasing guidelines on alcohol consumption was independently associated with being female, older, from a higher socioeconomic

background, and a lower risk drinker (Table 2). Recognition of the alcohol and cancer message was also associated with a greater level of agreement in the release of government guidance.

Predictors of intended behaviour change

Following the release of the alcohol guidelines, only 7% self-reported an intention to cut down their drinking. Multivariate analysis identified the following independent predictors of intended behaviour change (Table 3): higher risk drinkers were three times more likely; people who recognized the alcohol and cancer message were twice as

Table 2 Awareness, knowledge of and attitude to the new drinking guidelines

		Aware of new drinking guidelines (n = 972)					Correct knowledge of new drinking guidelines (n = 972)					Government responsibility to release guidelines (n = 972)				
		Yes (%)	Univariate		Multivariate		Yes	Univariate		Multivariate		Strongly agree/agree	Univariate		Multivariate	
			OR	P-value	OR	P-value		OR	P-value	OR	P-value		OR	P-value	OR	P-value
Total		71					8					63				
Gender	Male	76					10					58				
	Female	65	0.58	0.001	0.53	<0.001	5	0.52	0.010	–	–	69	1.49	0.004	1.46	0.012
Age	18–25	61					6					66				
	26–35	64	1.12	0.596	1.07	0.323	5	0.81	0.679	–	–	65	0.80	0.370	0.82	0.467
	36–45	72	1.65	0.024	1.48	0.114	10	1.81	0.159	–	–	69	0.94	0.830	0.98	0.956
	46–55	76	2.00	0.001	1.88	0.010	9	1.65	0.226	–	–	58	0.56	0.012	0.54	0.013
	56+	78	2.26	0.004	1.69	0.094	9	1.63	0.317	–	–	61	0.59	0.057	0.51	0.023
Social grade	C2DE	62					4					57				
	ABC1	74	1.80	<0.001	1.76	0.001	9	2.42	0.009	2.34	0.013	67	1.50	0.008	1.41	0.033
AUDIT-C	Low risk	69					6					71				
	Increasing risk	76	1.45	0.013	–	–	11	2.02	0.005	–	–	61	0.64	0.002	0.64	0.005
Recognition of no safe limit message	No	58					6					64				
	Yes	88	5.45	<0.001	4.49	<0.001	10	1.67	0.033	–	–	69	1.24	0.127	–	–
Recognition of cancer message	No	65					6					65				
	Yes	88	3.98	<0.001	2.73	<0.001	12	2.04	0.004	1.93	0.012	72	1.41	0.039	1.46	0.030

Bold values are for $P < 0.05$.

likely; and those aged 46–55 are three times more likely than those aged 18–25 to report an intention to cut down.

Around one-third reported that they planned to use the guidelines to keep track of their drinking, even though only 8% actually knew what the new guidelines were. Of those who could correctly identify the content of the guidelines were 1.7 times more likely to intend to use the guidelines to monitor consumption than those who could not (Table 3). However, higher risk drinkers were 1.6 times less likely to plan on using the guidelines than low risk drinkers. The other factor independently associated with using the guidelines to keep track of alcohol consumption was being female.

Health messaging surrounding the new alcohol guidelines

Recognition of alcohol health messaging in the media was explored for the whole study population, regardless of whether the participant was aware that new alcohol guidelines had been released. Those who were aware of the new guidelines were approximately three times as likely to recognize these health messages as compared to those who were unaware (Fig. 1). This was seen for the three messages

that there is no safe level of drinking; alcohol causes cancer; and alcohol does not protect against heart disease.

Overall, there was a high level of agreement with the content of the health messages surrounding the guidelines (Supplementary information). Almost 9 in 10 people (87%) agreed that it was safest not to drink at all during or when planning a pregnancy, with just over 70% agreeing that having drink-free days is a good way to cut down on drinking and that there is no safe level of drinking. The link between regular drinking and long-term cancer risk was agreed with by 61% of people. The one message that did not show agreement was with the explanation that the risks of exceeding the limits in the guidelines was similar to that of driving a car, even though this form a key justification for the guidelines that was used during their publication.

Discussion

Main findings of this study

There was a high level of awareness of the UK's new low risk drinking guidelines one month after their publication. This almost certainly reflects the media coverage of the guidelines in broadcast, print and online outlets at the time. This coverage was

Table 3 Intended behaviour change following the release of the new drinking guidelines

		Intention to change drinking habits (n = 610)					Intention to use guidelines to keep track of drinking (n = 638)				
		Yes (%)	Univariate		Multivariate		Always/often/ sometimes	Univariate		Multivariate	
			OR	P-value	OR	P-value		OR	P-value	OR	P-value
Total		7					33				
Gender	Male	5					27				
	Female	9	1.03	0.857	–	–	40	1.54	0.003	1.77	0.002
Age	18–25	3					30				
	26–35	4	1.25	0.617	1.27	0.608	31	1.38	0.233	–	–
	36–45	6	1.38	0.430	1.62	0.251	30	1.47	0.124	–	–
	46–55	10	2.47	0.018	2.74	0.011	33	1.35	0.211	–	–
	56 +	9	2.34	0.047	2.09	0.110	42	1.86	0.032	–	–
Social grade	C2DE	9					29				
	ABC1	7	0.67	0.082	–	–	35	1.20	0.279	–	–
AUDIT-C	Low risk	3					40				
	Increasing risk	10	4.01	<0.001	4.14	<0.001	25	0.59	<0.001	0.52	<0.001
Recogn of no safe limit message	No	5					33				
	Yes	8	0.97	0.890	–	–	33	0.98	0.878	–	–
Recogn of cancer message	No	6					31				
	Yes	10	1.71	0.011	1.68	0.021	38	1.18	0.279	–	–
Correct G/L knowledge	No	6					30				
	Yes	13	1.64	0.093	–	–	51	2.15	0.001	2.87	<0.001

Bold values are for $P < 0.05$.

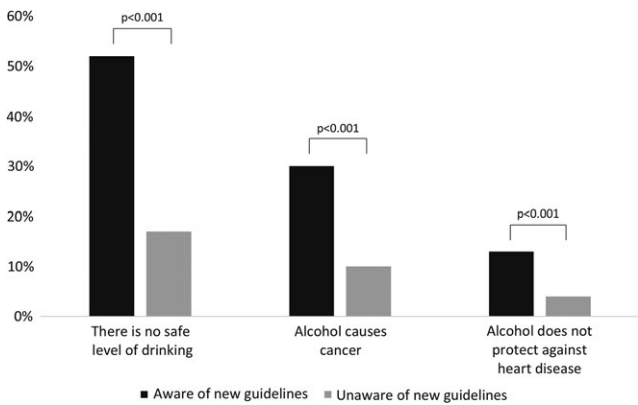


Fig. 1 Recall of recent alcohol health messages for those who were and were not aware that new low risk drinking guidelines had been released.

prompted by a government press release and comments from health charities and other relevant stakeholders. Higher awareness amongst men may reflect the fact that recommended levels of consumption were significantly reduced for males but not females. However, awareness was lower in amongst less affluent groups. As alcohol harms are more frequently experienced by these groups this suggests that targeted communication is needed in order to address inequalities that may arise from this

type of health information. Greater alcohol harms amongst these groups can be experienced due to co-morbidities or clustering of more harmful health behaviours such as smoking, poor diet and excess weight.⁵ This may merit a more comprehensive approach to risk communication, including in healthcare settings such as primary care, to raise awareness of both alcohol and other behavioural risk factors for cancer and other chronic diseases.

A quarter of the study population recognized the message that alcohol causes cancer. People who recognized the alcohol and cancer link were on average twice as likely to correctly identify the new recommended drinking limits in the guidance. This is consistent with previous research in both Australia⁸ and the UK²² that found that individuals who correctly identified alcohol as a risk factor for cancer were more supportive of measures to reduce alcohol consumption or the harms from alcohol in the population, including the provision of accurate information about alcohol and health.

In addition, respondents who recognized the link between alcohol and cancer were more likely than most other groups to report that they might reduce their drinking following the release of the guidelines. Behavioural intentions are weak measures of actual behaviour change, however, and further

research²³ is now underway to identify whether communication of the new guidelines has resulted in a shift in patterns of alcohol consumption in the UK.

What is already known on this topic

UK low risk drinking guidelines were updated in January 2016 to reflect new evidence in alcohol health harms, including the association between alcohol and cancer.¹³ The limited evidence available from other countries suggest that while promotion of alcohol guidelines might raise awareness of the recommended drinking limits, it does not reduce alcohol consumption.^{17–20,24}

What our study adds

To date this is the first study investigating the impact of the UK's new guidelines on alcohol health knowledge and intended drinking behaviours. Our survey also found that the general public believed that government had a role in communicating health messages to the population and that the guidelines provided an appropriate platform for health messaging. In particular, the prominence of the evidence linking alcohol consumption to cancer risk in the communication of the guidelines is important. This suggests that this type of health messaging, which links recommendations to disease specific evidence, may improve the salience and understanding of government advice on health behaviours.

Limitations of this study

Limitations of the study include the short time frame involved which only captured immediate (within one month) responses to the new guidelines. It is likely that recall will diminish over time without sustained communication of guideline content. In addition, the cross-sectional nature of the data collected means that the relationships observed between the characteristics of respondents and their awareness and understanding of the guidelines (and intentions around behaviour change) may be explained by other factors not covered by the survey. A priority for future research should be the impact of revised low risk drinking guidelines on alcohol consumption and alcohol-related harm in the population, alongside assessing whether awareness of the content of the guidelines is sustained in the UK population through time.

Supplementary data

Supplementary data are available at the *Journal of Public Health* online.

Conflicts of interest statement

None.

Authors' contributions

GR designed the study, analysed the data, interpreted the results and contributed to the article preparation. LB contributed to the study design, results interpretation and article preparation. LH, PB and JH contributed to the survey development and article preparation. JV contributed to the study design and article preparation. All authors have read and approved the final article.

Funding

This research was supported by funding from Cancer Research UK.

References

- 1 World Health Organization. *Global Status Report on Alcohol and Health*. Switzerland: World Health Organization, 2014.
- 2 Connor J. Alcohol consumption as a cause of cancer. *Addiction* 2016;**112**(2):222–8.
- 3 Office for National Statistics (ONS). Chapter 2—Drinking (General Lifestyle Survey Overview—A Report on the 2011 General Lifestyle Survey).
- 4 Marmot M. Fair society, healthy lives. *Inequalities in Health: Concepts, Measures, and Ethics* 2013: 282.
- 5 Bellis MA, Hughes K, Nicholls J *et al*. The alcohol harm paradox: using a national survey to explore how alcohol may disproportionately impact health in deprived individuals. *BMC Public Health* 2016;**16**:111.
- 6 Public Health England. Health matters: harmful drinking and alcohol dependence, 2016.
- 7 Sanderson SC, Waller J, Jarvis MJ *et al*. Awareness of lifestyle risk factors for cancer and heart disease among adults in the UK. *Patient Educ Couns* 2009;**74**(2):221–7.
- 8 Buykx P, Gilligan C, Ward B *et al*. Public support for alcohol policies associated with knowledge of cancer risk. *Int J Drug Policy* 2015; **26**(4):371–9.
- 9 Buykx PJ, Gavens L, Lovatt M *et al*. *An Investigation of Public Knowledge of the Link Between Alcohol and Cancer*. UK: University of Sheffield and Cancer Research, 2015.
- 10 Kalinowski A, Humphreys K. Governmental standard drink definitions and low-risk alcohol consumption guidelines in 37 countries. *Addiction* 2016;**111**(7):1293–8.
- 11 House of Commons Science and Technology Committee. Alcohol Guidelines Eleventh Report of Session 2010–2012, 2012.
- 12 HM Government. The Government's Alcohol Strategy. London, 2012.
- 13 Department of Health. Alcohol Guidelines Review—Report From the Guidelines Development Group to the UK Chief Medical Officers, 2016.
- 14 Bowden JA, Delfabbro P, Room R *et al*. Alcohol consumption and NHMRC guidelines: has the message got out, are people conforming and are they aware that alcohol causes cancer? *Aust N Z J Public Health* 2014;**38**(1):66–72.

- 15 Bendtsen P, Karlsson N, Dalal K *et al.* Hazardous drinking concepts, limits and methods: low levels of awareness, knowledge and use in the Swedish population. *Alcohol Alcohol* 2011;**46**(5):638–45.
- 16 de Visser RO, Birch JD. My cup runneth over: young people's lack of knowledge of low-risk drinking guidelines. *Drug Alcohol Rev* 2012;**31**(2):206–12.
- 17 Babor T. *Alcohol: No Ordinary Commodity: Research and Public Policy*. USA: Oxford University Press, 2010.
- 18 Anderson P, Chisholm D, Fuhr DC. Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. *Lancet* 2009;**373**(9682):2234–46.
- 19 Wakefield MA, Loken B, Hornik RC. Use of mass media campaigns to change health behaviour. *Lancet* 2010;**376**(9748):1261–71.
- 20 Livingston M. Perceptions of low-risk drinking levels among Australians during a period of change in the official drinking guidelines. *Drug Alcohol Rev* 2012;**31**(2):224–30.
- 21 Bush K, Kivlahan DR, McDonell MB *et al.* The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. Ambulatory Care Quality Improvement Project (ACQUIP). Alcohol Use Disorders Identification Test. *Arch Intern Med* 1998;**158**(16):1789–95.
- 22 Buykx P, Li J, de Matos EG *et al.* Factors associated with public support for alcohol policy in England: a population-based survey. *Lancet* 2016;**388**:S31.
- 23 National Institute for Health Research. *The Effectiveness of Promotional Campaigns Associated With the New UK Low Risk Drinking Guidelines: A Prospective Study*, 2017. <https://www.journalslibrary.nihr.ac.uk/programmes/hta/156301> (28 March 2017, date last accessed).
- 24 Gronbaek M, Strogger U, Strunge H *et al.* Impact of a 10-year nation-wide alcohol campaign on knowledge of sensible drinking limits in Denmark. *Eur J Epidemiol* 2001;**17**(5):423–7.