Calorie labelling on alcoholic beverages: opinions, drinking impacts and behaviour changes

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As part of the Alcohol Labelling Calorie Project carried out by the Obesity Policy Research Unit, we commissioned a series of questions to be added to the Ipsos Mori Omnibus Survey for three months (November 2021, December 2021, and January 2022). The nationally representative sample of 4,963 men and women completed questions about knowledge of calorie content of alcoholic drinks, attitudes to the introduction of alcohol calorie labelling, and how their drinking would change if alcoholic drinks were calorie labelled. These items were added to a detailed series of questions administered at the same time in the Alcohol Toolkit Study (https://www.alcoholinengland.info/graphs/monthly-tracking-kpi). This is a report of the findings.

Summary of findings

Support for the introduction of calorie labelling on alcoholic beverages is strong, with most people agreeing that such information would be useful to them. We quantified the number of drinks respondents said that they would consume on a drinking occasion if calorie labelling was introduced. Although most drinkers (70.7%) indicated that they would not change the number of drinks they consumed, a sizable proportion (42.3%) indicated that they would make positive behaviour changes, such as choosing lower calorie beverages or smaller servings. There was a striking lack of knowledge surrounding the calorie content of alcoholic beverages. Fewer than one in five respondents accurately estimated the calorie content of servings of beer, wine, cider, or spirits, and around 25% were not even prepared to make an estimate. There was widespread support for the implementation of mandatory calorie labelling on pre-packaged alcoholic beverages. Providing this knowledge unambiguously on an alcoholic beverage label will provide people with the necessary information to make an informed choice on their calorie intake and may potentially inform or support healthier drinking behaviours.

The study sample

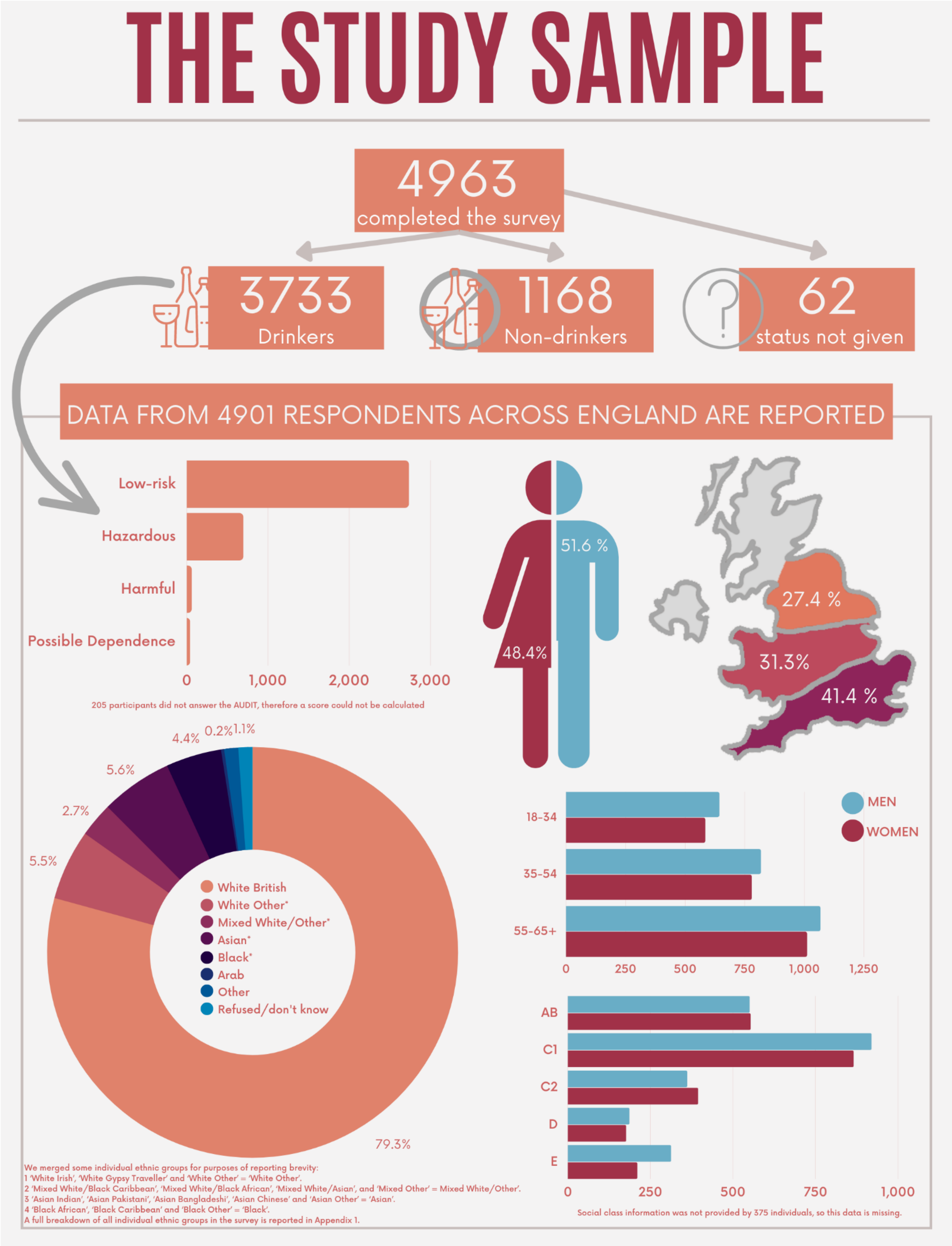
Of the 4,963 individuals who complete the survey, 3,733 reported that they drink alcohol, compared to 1,168 who ‘never’ drink alcohol. There were 62 individuals who did not answer questions from which their drinking status could be determined, resulting in a dataset of 4901 respondents across England (see *Infographic 1*). There were roughly equal proportions of men (*n*=2374) and women (*n*=2527). Although there were good proportions of respondents in each age category, with a mean age of 50.91 (±19.14), the largest group were aged 55 and older. The sample was predominantly White British (79.3%), and the majority reported a social grading of A-C2 (80.5%) according to the National Statistics Socio-economic classification. The Alcohol Use Disorders Identification Test (AUDIT), a standard screening measure for alcohol harm, was administered. Of those who reported drinking alcohol (*n*=3733), the majority were identified as low-risk drinkers (73.3%), but 21.2% were drinking at a hazardous or more harmful level (see *Table 1*).

Table 1. AUDIT Scores

Drinking Categories[1]	Sample (*n*)	Sample (%)
Non-drinkers[2]	1168	23.8
Low risk	2736	55.8
Hazardous	695	14.2
Harmful	59	1.2
Possible Alcohol Dependence	38	0.8
(Missing)	205	4.2
Sample	4901	100.0

[1]These were based on AUDIT scoring categories outlined by NICE that rate drinking from low risk to indicative of alcohol dependence (National Institute for Health and Care Excellence, 2022). [2]This is defined as reporting no drinking or drinking related behaviours (e.g. injury or doctor’s advice) in at least the past 6 months.

Infographic 1. Demographics information about the sample

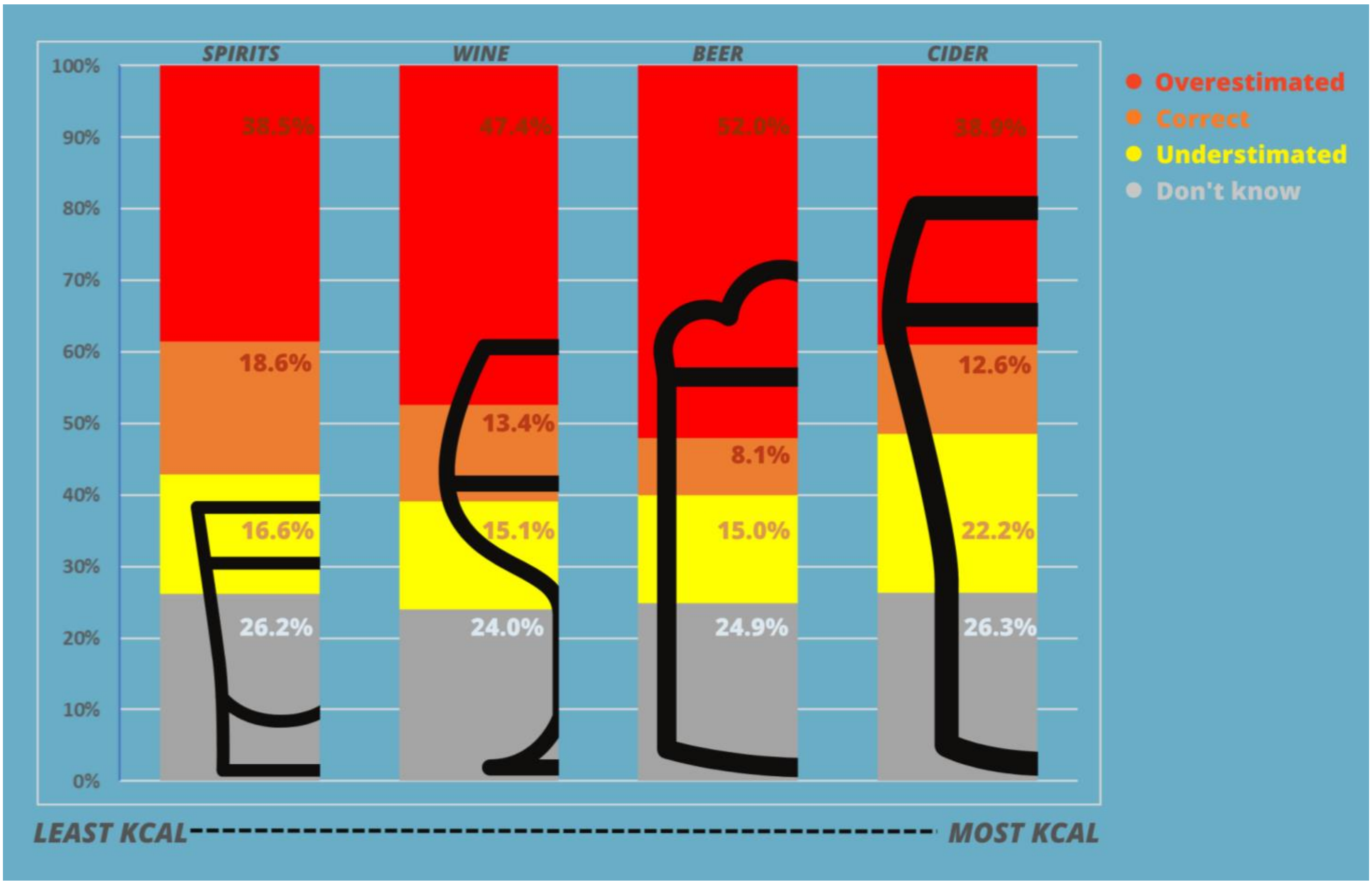


What do people know?

Estimating calories in common alcoholic beverages

We asked respondents about the number of calories in a single measure of gin or vodka (25ml), a medium glass of white wine (175ml, 13% strength), a pint of beer (586ml, 4% strength), and a pint of cider, (586ml, 4.5% strength). Answers were given in 50 kcal ranges, up to a maximum of '300+ kcal', and we assessed how many people responded in the correct category. It is interesting that a substantial number of people did not know the calorie content and, even when prompted, did not give an estimate. About a quarter of responses for each drink were 'don't know' (24-26.3%, see *Infographic 2*). A considerable proportion of individuals overestimated the number of calories in spirits (38.5%), wine (47.4%), beer (52.0%), and cider (38.9%).

Infographic 2. Bar graph showing accuracy of calorie estimates for each beverage



A small number of individuals refused to provide a response, specifically n=54, n=61, n=54, and n=63 for spirit, wine, beer, and cider, respectively.

We analysed the associations between gender, age, socioeconomic status, and drinker status and the accuracy of estimations using multinomial logistic regression. We computed the likelihood of overestimating, underestimating, or reporting 'don't know,' compared with estimating the correct calorie content (see Appendix 2). Table 2 summarises the findings.

Table 2. Accuracy of calorie estimates split by gender, socioeconomic status, non/drinkers, and age category (values are percentages)

Age

	Don't Know			Under			Correct			Over		
	18-34	35-54	55-65+	18-34	35-54	55-65+	18-34	35-54	55-65+	18-34	35-54	55-65+
Cider	16.7	17.1	39.1	26.8	17.9	22.8	15.9	13.2	10.1	40.6	51.8	28.0
Beer	15.7	16.1	37.3	16.3	10.0	18.0	9.5	8.5	6.9	58.6	65.4	37.8
Wine	17.2	15.1	35.0	15.9	10.3	18.4	15.1	12.7	13.0	51.8	62.0	33.6
Spirits	17.5	16.5	38.8	23.2	15.7	13.5	22.7	22.8	13.1	36.6	45.1	34.6

Gender

	Don't Know		Under		Correct		Over	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Cider	27.5	25.2	23.3	21.1	12.2	13.0	37.0	40.8
Beer	25.1	24.8	17.1	13.1	8.5	7.6	49.3	54.5
Wine	26.8	21.4	16.3	14.0	13.2	13.7	43.7	50.9
Spirits	28.5	24.0	18.4	15.0	16.9	20.2	36.2	40.7

Socioeconomic status

	Don't Know		Under		Correct		Over	
	Lower	**Higher**	**Lower**	**Higher**	**Lower**	**Higher**	**Lower**	**Higher**
Cider	34.0	20.4	24.7	20.9	11.4	13.5	29.8	45.3
Beer	32.9	19.0	19.1	12.7	7.1	8.7	40.9	59.6
Wine	32.9	17.6	18.5	13.1	13.0	14.2	35.7	55.1
Spirits	35.1	19.9	17.1	16.4	14.5	21.8	33.4	41.9

Non-drinkers or drinkers

	Don't Know		Under		Correct		Over	
	Non	**Drinker**	**Non**	**Drinker**	**Non**	**Drinker**	**Non**	**Drinker**
Cider	40.7	21.9	21.6	22.4	9.0	13.7	28.7	42.0
Beer	40.0	20.3	16.8	14.5	6.2	8.6	37.0	56.6
Wine	40.2	19.1	15.7	14.9	12.0	13.9	32.0	52.1
Spirits	41.3	21.6	14.2	17.4	12.1	20.6	32.5	40.4

Increasing age was associated with increased likelihood of an individual reporting that they did not know the calorie content, compared to reporting the correct calories, for all beverages (ps<.001), as well as increased likelihood of underestimating compared to reporting the correct calorie content for all beverages (ps≤.003) (except for spirits). Increasing age was associated with increased likelihood of overestimating spirit calories (p<.001) but decreased likelihood of overestimating wine calories (p<.001).

Males were more likely to report that they did not know the calorie content, compared with reporting the correct calories, for all beverages (ps≤.025), (except beer), and were more likely to underestimate the calorie content of spirits than females (p<.001). Females were more likely to overestimate the calorie content of wine compared to males (p=.037).

Individuals of lower SES were more likely to underestimate or report that they did not know the calorie content, compared to reporting the correct calories, for all beverages compared to individuals of higher SES (ps≤.022). However, individuals of higher SES were more likely to overestimate than report the correct calorie content of wine and cider compared to individuals of lower SES (ps≤.001).

Non-drinkers were more likely to report that they did not know the calorie content, compared to reporting the correct calories, for all beverages (ps<.001), more likely to underestimate the calorie content of cider and beer (ps≤.002), and to overestimate the calorie content of spirits (p=.002), as opposed to reporting the correct calories, compared to drinkers. Drinkers were more likely to overestimate the calorie content of wine (p<.001), than non-drinkers.

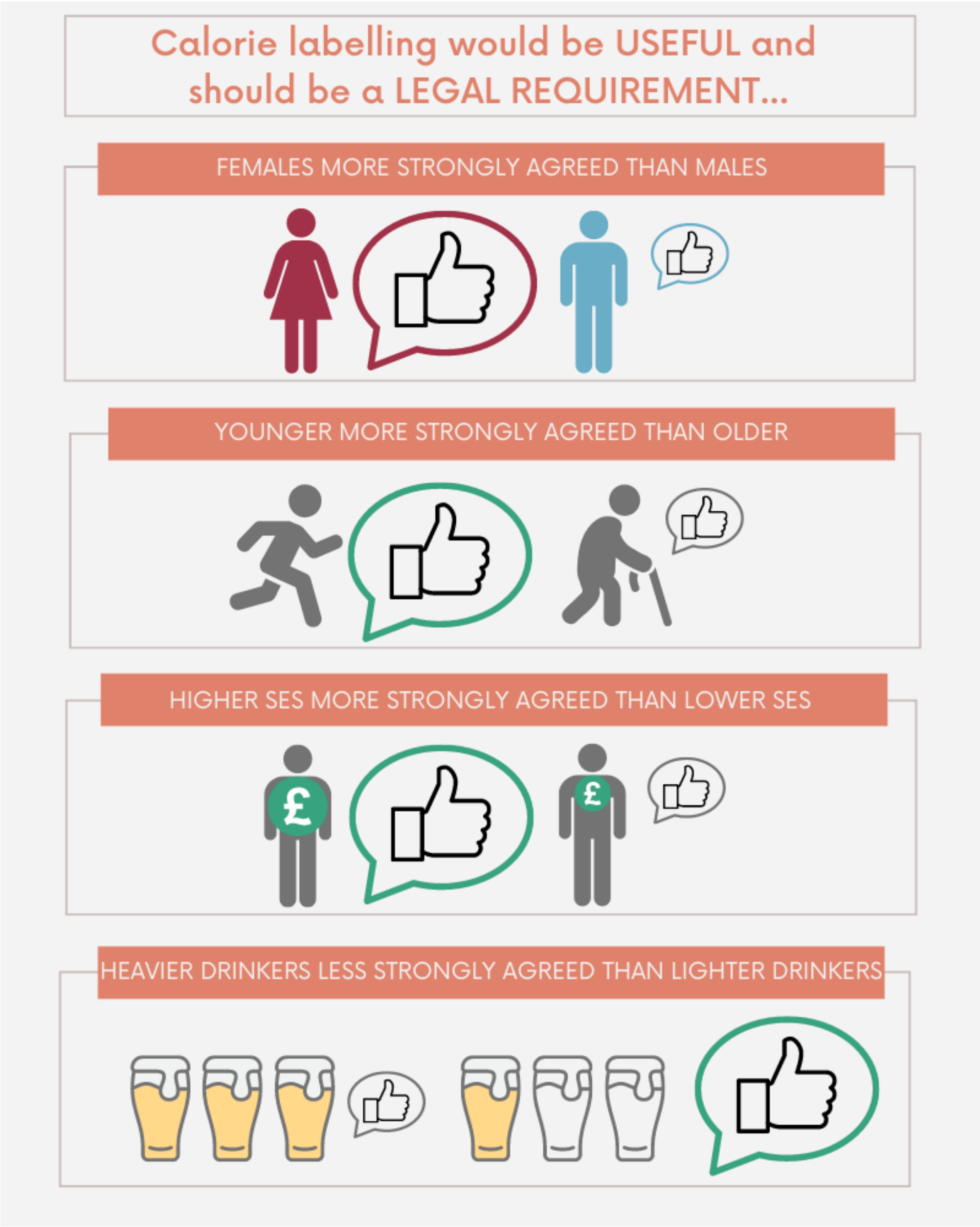
In summary, males, older people, non-drinkers, and respondents of lower socioeconomic status were more likely than others to state that they did not know the calorie content of alcoholic drinks, or to underestimate the calories of some alcoholic beverages.

What do people think about alcohol calorie labelling?

Acceptance and perceived usefulness of alcohol calorie labelling

We asked participants a series of questions about the acceptability and usefulness of calorie labelling. Most individuals supported alcohol labelling as a legal requirement. The majority tended to ‘agree’ or ‘strongly agree’ that calorie information should be provided on alcohol drinks purchased from shops (61.2%) or pubs, bars, and restaurants (49.7%). In addition, most individuals agreed that calorie labelling on alcohol drinks would be useful to them (55.4%).

Infographic 3. Summary of individual differences in agreement that calorie labelling would be useful and should be a legal requirement



Female respondents showed stronger support for calorie labelling on beverages purchased from shops than males (*p*=.006), although there were no differences for support for calorie labelling on beverages from eateries (*p*=.057). Also, females more strongly agreed that they would find calorie labelling useful (*p*<.001) than males. Individuals of higher SES showed stronger support for calorie labelling on beverages purchased from shops than individuals of lower SES (*p*=.010), although there were no significant differences for support for calorie labelling on beverages from eateries (*p*=.661). Also, individuals of higher SES more strongly agreed that they would find calorie labelling useful (*p*=.011) than individuals of lower SES.

Age was negatively associated with agreement, such that lower age was associated with stronger agreement for calorie labelling on shop-bought beverages (*p*=.002) (although this was not significant for beverages purchased at eateries, *p*=.053). Age was also negatively associated with agreement that calorie labels would be useful, such that lower age was associated with stronger agreement (*p*=.001). Higher AUDIT scores, indicative of heavier, more harmful drinking, were negatively associated with agreement, such that heavier drinkers were less likely to believe that calorie labelling on beverages purchased in shops and eateries was desirable (*ps*<.001). Similarly, heaver drinkers were less likely to agree that labels would be useful (*p*<.001). These individual differences are summarised in *Infographic 3*.

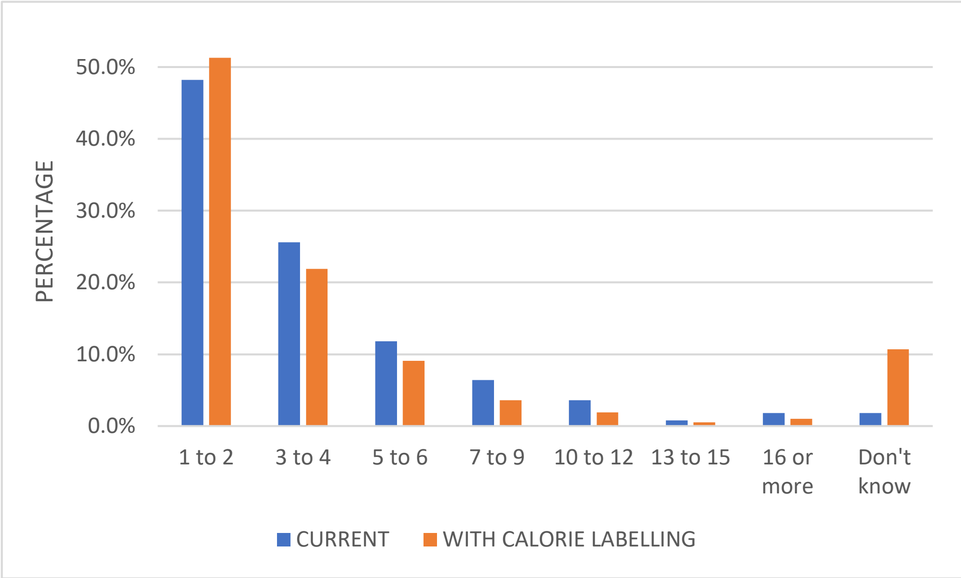
What will people do if calorie labelling is introduced?

Estimated changes in drinking

We asked alcohol drinkers what they would do if calorie labelling was introduced, and 3,649 (98%) responded.

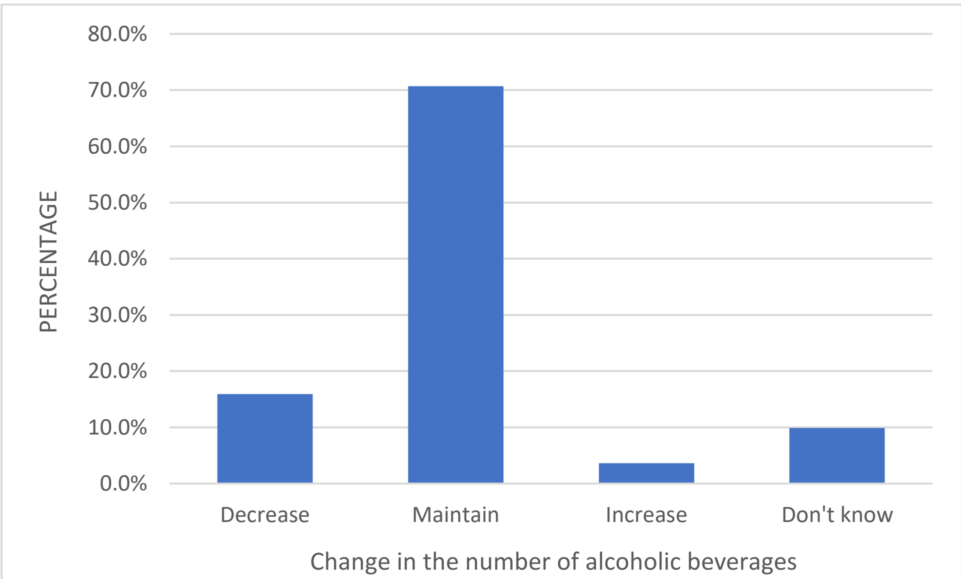
As part of the Alcohol Toolkit Study, respondents were asked about the current number of alcoholic beverages consumed on a typical drinking occasion. We compared this with an estimate of number of alcoholic beverages they would drink if calorie labelling were introduced. Across the whole sample, there appears to be a slight shift towards consuming fewer drinks (see *Figure 1*).

Figure 1. Bar graphs displaying the number of alcoholic beverages consumed currently compared to prospective numbers if calorie labelling were provided



We also calculated the proportion of people who reported that they would decrease, stay the same, or increase the number of drinks they would consume if calorie labelling were introduced. As can be seen in Figure 2, some 15.9% indicated that they would decrease the number of alcoholic beverages consumed at a typical drinking occasion, with a small number reporting they would increase (3.6%). Interestingly, almost a tenth of individuals reported that they did not know how many drinks they would have if calorie labelling was introduced (9.9%).

Figure 2. Bar graphs displaying the likely change in the number of alcoholic beverages consumed at a typical drinking occasion with calorie labelling



A multinomial logistic regression was conducted to investigate associations between age, socioeconomic status and gender and the likelihood of decreasing, increasing, or report that they 'did not know' how they current number of beverages would change, compared to maintaining their current number (see Appendix 3).

Younger age was associated with increased likelihood that an individual would drink fewer alcoholic beverages ($p<.001$). Similarly, higher SES respondents were more likely to report reducing the number of beverages compared with individuals of lower SES ($p=.015$). Although numbers were small, males were more likely to say that they would increasing number of alcoholic drinks compared with females ($p=.035$) Individuals with lower AUDIT scores, indicative of lower, less harmful drinking, were more likely to report maintaining their current number of beverages than individuals with higher AUDIT scores. As such, having a higher AUDIT score was associated with increased likelihood that individuals would change their number of beverages consumed (decrease or increase), or report that they 'did not know' how their number of beverages would change, compared to maintaining their current number (*ps*<.001).

Estimated changes in related behaviours

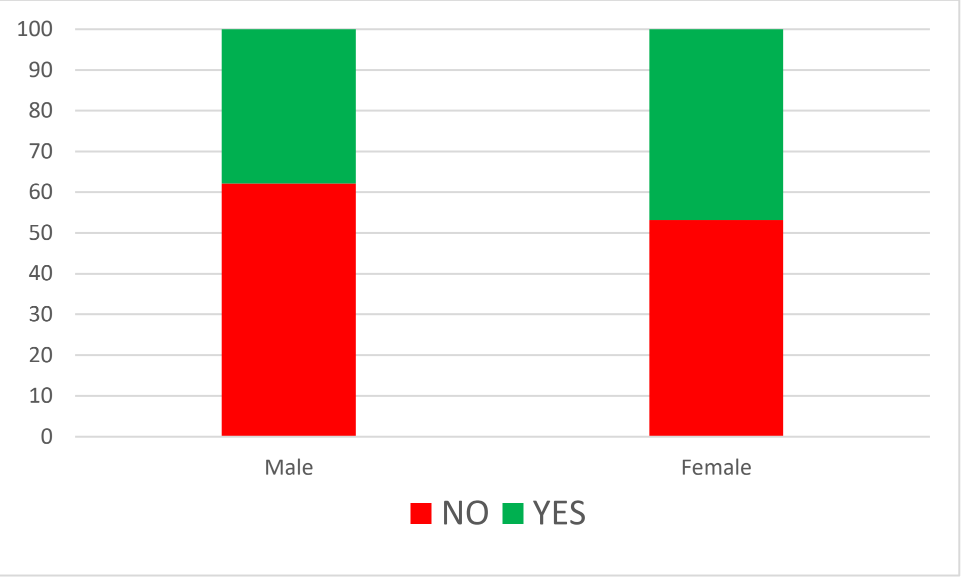
Apart from changing the number of drinks they might have, we also asked respondents whether they would change their drinking behaviour in other ways. The behaviours that we asked about included drinking less often, choosing lower calorie drinks, selecting smaller servings, or compensating by eating less or exercising more.

42.3% of drinkers indicated that they would engage in at least one behaviour change if calorie labelling were introduced. Of these, around one third (33.3%) indicated that they would change their drinking behaviour in a way that reduced either their alcohol or calorie (i.e. lower calorie beverages) intake, with some 17.2% indicated that they would engage in compensatory behaviours, such as eating less or exercising more. The most popular change was to choose lower calorie alcoholic beverages, with nearly half of these individuals selecting this option (49.3%). Less popular was drinking less often (32.9%) or having smaller servings (29.9%). Figure 3 shows splits by gender and socioeconomic status.

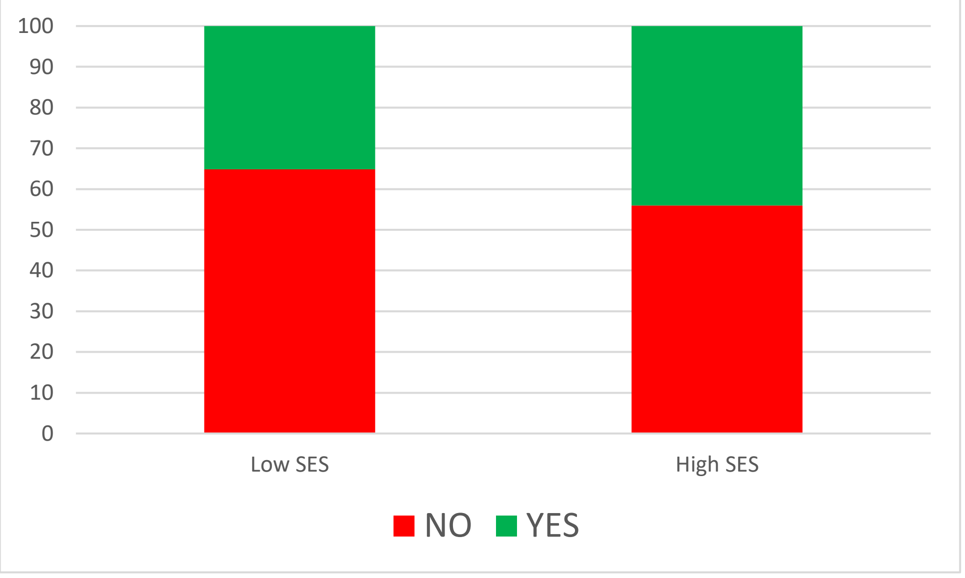
If we just include those who indicated that they would not reduce their number of drinks if faced with calorie labelling, there is still a substantial number who suggest they would make at least one positive drinking behaviour change (38.3%).

Figure 3. Behaviour change indicated (yes/no) split by gender and socioeconomic status

(a) Gender



(b) Socioeconomic status



A binomial logistic regression was conducted to investigate associations between AUDIT score, age, gender, socioeconomic status, and the likelihood that they would opt to change their behaviour (see Appendix 4). Higher AUDIT scores (p=.007), younger age (p<.001) and being a female (p<.001) individual of higher SES (p=.001) were associated with increased likelihood that an individual would opt to change their behaviour. Infographic 4 shows a summary of expected changes in behaviour if mandatory calorie labelling were introduced.

Infographic 4. Summary of expected changes in behaviour if mandatory calorie labelling were introduced

Appendix

Appendix 1 – Demographics Tables

Table S1. Government office region distributions

	Sample (*n*)	**Sample (%)**
North[1]	1342	27.4
Midlands[2]	1532	31.3
South[3]	2027	41.4
Sample	4901	100.0

[1]'North' encompasses 'Northwest', 'Northeast' and 'Yorkshire and the Humber'. [2]'Midlands encompasses 'East Midlands', 'West Midlands' and 'East of England'. [3]'South' encompasses 'London', 'Southeast' and 'Southwest'.

Table S2. Sample age category distributions

	18-34	**35-54**	**55-65+**	**Sample**
Men	584	779	1011	2374
Women	643	817	1067	2527
Sample	1227	1596	2078	4901

Table S3. Social grade (A-E) distributions

	AB	**C1**	**C2**	**D**	**E**	**Sample**
Male	553	865	394	176	210	2198
Female	550	919	361	186	312	2328
Sample	1103	1784	755	362	522	4526

Social class information was not provided by 375 individuals, so this data is missing.

Table S4. Ethnicity distributions

	Sample (*n*)	Sample (%)
White British	3885	79.3
White Irish	54	1.1
White Gypsy Traveller	10	0.2
White Other	208	4.2
Mixed White/Black Caribbean	41	0.8
Mixed White/Black African	25	0.5
Mixed White/Asian	25	0.5
Mixed Other	42	0.9
Asian Indian	103	2.1
Asian Pakistani	87	1.8
Asian Bangladeshi	33	0.7
Asian Chinese	16	0.3
Asian Other	37	0.8
Black African	109	2.2
Black Caribbean	65	1.3
Black Other	40	0.8
Arab	12	0.2
Other	54	1.1
Don’t know	10	0.2
Refused	45	0.9
Sample	4901	100.0

Appendix 2– Investigating estimated calorie content of beverages (Multinomial Regressions)

Table S5. Multinomial logistic regression results (Calorie content of cider)

		95% CI for Odds Ratio		
	b (SE)	Lower	Odds Ratio	Upper
Under vs. Correct estimate				
Age	0.01 (0.003)**	1.003	1.008	1.014
SES[1]	0.24 (0.10)**	1.035	1.268	1.554
Gender[2]	0.16 (0.10)	0.961	1.176	1.439
Non/Drinker[3]	0.45 (0.13)**	1.210	1.573	2.044
Over vs correct				
Age	-0.001 (0.003)	0.994	0.999	1.004
SES[1]	-0.32 (0.10)**	0.602	0.725	0.875
Gender[2]	-0.03 (0.09)	0.809	0.973	1.169
Non/Drinker[3]	0.18 (0.13)	0.937	1.201	1.539
Don't know vs correct				
Age	0.04 (0.003)***	1.032	1.038	1.044
SES[1]	0.39 (0.11)***	1.204	1.481	1.821
Gender[2]	0.24 (0.11)*	1.030	1.265	1.553
Non/Drinker[3]	1.14 (0.13)***	2.431	3.141	4.057

R^2 = 0.13 (Cox-Snell), 0.14 (Nagelkerke). Model $\chi^2(12)$ = 614.88 *p*<.001. **p*<.05, ***p*<.01, ****p*<.001. [1] SES is coded as 0=low, 1=high. [2]Gender is coded as 0=male, 1=female. [3] Non/Drinker is coded as 1=non, 2=drinker.

Table S6. Multinomial logistic regression results (Calorie content of Beer)

		95% CI for Odds Ratio		
	b (SE)	Lower	Odds Ratio	Upper
Under vs. Correct				
Age	0.02 (0.004)***	1.009	1.016	1.023
SES[1]	0.55 (0.13)***	1.335	1.728	2.237
Gender[2]	0.21 (0.13)	0.956	1.235	1.594
Non/Drinker[3]	0.52 (0.16)**	1.218	1.679	2.314
Over vs correct				
Age	-0.01 (0.003)	0.989	0.995	1.001
SES[1]	-0.14 (0.11)	0.695	0.869	1.086
Gender[2]	-0.18 (0.11)	0.673	0.838	1.043
Non/Drinker[3]	-0.03 (0.15)	0.729	0.973	1.299
Don't know vs correct				
Age	0.04 (0.003)***	1.029	1.036	1.043
SES[1]	0.58 (0.13)***	1.391	1.780	2.279
Gender[2]	-0.02 (0.12)	0.772	0.985	1.257
Non/Drinker[3]	1.11 (0.15)***	2.242	3.034	4.105

R^2 = 0.15 (Cox-Snell), 0.16 (Nagelkerke). Model $\chi^2(12)$ = 727.61, *p*<.001. **p*<.05, ***p*<.01, ****p*<.001. [1] SES is coded as 0=low, 1=high. [2]Gender is coded as 0=male, 1=female. [3] Non/Drinker is coded as 1=non, 2=drinker.

Table S7. Multinomial logistic regression results (Calorie content of Wine)

		95% CI for Odds Ratio		
	b (SE)	Lower	Odds Ratio	Upper
Under vs. Correct				
Age	0.01 (0.003)**	1.004	1.010	1.016
SES[1]	0.38 (0.11)**	1.179	1.468	1.828
Gender[2]	0.17 (0.11)	0.955	1.188	1.478
Non/Drinker[3]	0.12 (0.13)	0.866	1.122	1.454
Over vs correct				
Age	-0.01 (0.003)***	0.984	0.989	0.994
SES[1]	-0.32 (0.09)**	0.608	0.729	0.875
Gender[2]	-0.19 (0.09)*	0.690	0.826	0.988
Non/Drinker[3]	-0.43 (0.11)***	0.522	0.652	0.814
Don't know vs correct				
Age	0.03 (0.003)***	1.021	1.027	1.033
SES[1]	0.57 (0.11)***	1.430	1.759	2.164
Gender[2]	0.32 (0.11)**	1.122	1.378	1.693
Non/Drinker[3]	0.83 (0.12)***	1.824	2.303	2.907

R^2 = 0.15 (Cox-Snell), 0.16 (Nagelkerke). Model $\chi^2(12)$ = 719.41, *p*<.001. **p*<.05, ***p*<.01, ****p*<.001. [1] SES is coded as 0=low, 1=high. [2]Gender is coded as 0=male, 1=female. [3] Non/Drinker is coded as 1=non, 2=drinker.

Table S8. Multinomial logistic regression results (Calorie content of Spirits)

		95% CI for Odds Ratio		
	b (SE)	Lower	Odds Ratio	Upper
Under vs. Correct				
Age	0.004 (0.003)	0.999	1.004	1.010
SES[1]	0.40 (0.10)***	1.221	1.485	1.808
Gender[2]	0.45 (0.10)***	1.289	1.564	1.898
Non/Drinker[3]	0.20 (0.13)	0.945	1.220	1.573
Over vs correct				
Age	0.01 (0.002)***	1.006	1.011	1.016
SES[1]	0.12 (0.09)	0.953	1.125	1.329
Gender[2]	0.12 (0.08)	0.962	1.131	1.331
Non/Drinker[3]	0.34 (0.11)**	1.129	1.398	1.733
Don’t know vs correct				
Age	0.04 (0.003)***	1.035	1.041	1.046
SES[1]	0.74 (0.10)***	1.734	2.094	2.529
Gender[2]	0.50 (0.10)***	1.365	1.645	1.982
Non/Drinker[3]	1.18 (0.12)***	2.581	3.237	4.059

R^2 = 0.13 (Cox-Snell), 0.14 (Nagelkerke). Model $\chi^2(12) = 614.00$, $p<.001$. *$p<.05$, **$p<.01$, ***$p<.001$. [1] SES is coded as 0=low, 1=high. [2]Gender is coded as 0=male, 1=female. [3] Non/Drinker is coded as 1=non, 2=drinker.

Appendix 3 – Intended changes in number of alcoholic beverages consumed on a typical occasion if calorie information were added (multinomial regression)

Table S9. Multinomial logistic regression results

		95% CI for Odds Ratio		
	b (SE)	Lower	Odds Ratio	Upper
Decrease vs. maintain				
Age	-0.01 (0.003)***	0.983	0.989	0.995
AUDIT Score	0.15 (0.01)***	1.138	1.165	1.192
SES[1]	-0.25 (0.10)*	0.633	0.777	0.953
Gender[2]	-0.01 (0.10)	0.824	1.005	1.226
Increase vs. maintain				
Age	-0.004 (0.01)	0.986	0.996	1.007
AUDIT Score	0.09 (0.02)***	1.046	1.094	1.144
SES[1]	0.18 (0.19)	0.827	1.201	1.745
Gender[2]	0.42 (0.20)*	1.031	1.516	2.230
Don't know vs. maintain				
Age	0.02 (0.004)***	1.009	1.016	1.023
AUDIT Score	0.11 (0.02)***	1.079	1.113	1.147
SES[1]	0.24 (0.13)	0.992	1.271	1.627
Gender[2]	0.21 (0.13)	0.955	1.229	1.580

R^2 = 0.09 (Cox-Snell), 0.11 (Nagelkerke). Model $\chi^2(12) = 301.27$, $p<.001$. *$p<.05$, **$p<.01$, ***$p<.001$. [1] SES is coded as 0=low, 1=high. [2]Gender is coded as 0=male, 1=female.

Appendix 4 – Individual differences in the likelihood of behaviour change

Table S10. Binomial logistic regression results

		95% CI for Odds Ratio		
	b (SE)	Lower	Odds Ratio	Upper
Behaviour Change				
Gender[1]	0.43 (0.07)***	1.336	1.542	1.780
SES[2]	-0.24 (0.07)**	0.681	0.787	0.908
AUDIT Score	0.03 (0.01)**	1.007	1.025	1.043
Age	-0.02 (0.002)***	0.977	0.981	0.985

R^2 = 0.05 (Cox-Snell), 0.06 (Nagelkerke). Model $\chi^2(4) = 155.94$, $p<.001$. *$p<.05$, **$p<.01$, ***$p<.001$. [1]Gender is coded as 0=male, 1=female. [3] Non/Drinker is coded as 1=non, 2=drinker. [2]SES is coded as 0=low, 1=high.