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Characteristics of consumers of alcohol-free and low-alcohol drinks in Great Britain: A cross-sectional study

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Abstract

Introduction: The impact of alcohol-free and low-alcohol (no/lo) drinks on public health and health inequalities depends on who consumes them and how they are consumed. This study aimed to estimate: (i) the proportions of adults in Great Britain who consume no/lo drinks at different frequencies and in different settings; and (ii) the associations between no/lo drink consumption and individual characteristics.

Method: Pooled data ($N = 7691$) from four waves of a repeat cross-sectional survey on alcohol use completed in 2022–2023 by adults (16+) resident in Great Britain were analysed using descriptive statistics and logistic regression models.

Results: In all, 31.3% of adults reported ever consuming no/lo drinks and 9.8% reported drinking them weekly. Ever consumption of no/lo drinks was associated with: being an increasing risk drinker of alcohol relative to not drinking (OR_{adj}: 3.96, 95% CI 3.27–4.80), being aged 16–24 compared with 65+ (OR_{adj}:1.29, 95% CI 1.07–1.57), having previously smoked compared with having never smoked (OR_{adj}:1.19, 95% CI 1.05–1.34) and living in a rural rather than urban area (OR_{adj}:1.14, 95% CI 1.00–1.29). It was less likely among those in lower social grades or with lower educational qualifications; those living in Yorkshire and the Humber, and Scotland, compared with the South-East of England; and those using nicotine products.

Discussion and Conclusions: A third of adults in Great Britain have consumed no/lo drinks and approximately one in 10 do so weekly. Consumption is more common among riskier drinkers of alcohol and among more advantaged social groups, which may contribute to the sustaining or widening of health inequalities.

KEYWORDS
alcohol, alcohol consumption, alcohol strength, alcohol-free, non-alcoholic

1 | INTRODUCTION

The UK Government proposed increasing the availability of alcohol-free and low-alcohol drinks within its prevention strategy to reduce alcohol consumption and related harms [1]. Definitions of these products vary between countries and contexts [2], but the UK Government defines alcohol-free drinks as beers, ciders, wines and spirits containing up to 0.05% alcohol by volume (ABV), and low-alcohol drinks as those containing more than 0.05% ABV and up to 1.2% ABV [3]. These two categories are commonly combined under the umbrella term no/lo

drinks with the former accounting for the vast majority of no/lo drinks sales (82% of total no/lo sales by volume in 2023) [4, 5]. No/lo drinks only make up a small segment of the alcohol market in Great Britain, accounting for 1.06% of total alcohol sales by volume in 2021 [6]. However, this figure is increasing rapidly and is larger in the off-trade (i.e., shops) and particularly for off-trade sales of beer where no/lo drinks accounted, respectively, for 1.28% and 1.71% of total alcohol sales volume in 2021 [2, 6, 7].

Understanding who drinks no/lo products is important for at least three reasons. First, the growth in no/lo drinks sales might have a positive impact on public health if these products are consumed as substitutes for standard alcoholic drinks, particularly by the heaviest drinkers. Second, no/lo drinks may contribute to the reduction of health inequalities if they are consumed as substitutes for standard alcoholic drinks by less advantaged groups. Third, understanding who consumes no/lo drinks may help public health practitioners target interventions that promote uptake of these products, their use in place of standard alcoholic drinks or, conversely, reduced use where this may be harmful (e.g., in alcohol-free settings where this may normalise the presence of alcohol-like products and branding).

To date, there is little quantitative evidence on who drinks no/lo products. Previous studies from the UK, Finland and the USA found that no/lo drinks were more likely to be purchased or consumed by men, those who were more socially advantaged, those who drank standard alcoholic drinks and heavier drinkers [2, 8, 9]. A further study from Great Britain found similar results among non-alcoholic-beer consumers [10]. It also found that lower strength beers up to 3.5% ABV were more likely to be bought and drank by those who bought more alcohol overall. These studies provide contrasting evidence on the age of no/lo consumers. The studies from the UK and Great Britain found that no/lo purchasing and consumption was most common among younger adults aged 18–34 and 35–44 [2, 10]. The study from Finland found no/lo purchasing to be most common among those aged 60 and older [8]. However, these studies only provide data up to 2020, meaning more up-to-date evidence is required to capture the potentially shifting characteristics of no/lo consumers as this emerging market evolves. Evidence that no/lo drinks are less likely to be consumed by less advantaged groups suggests that no/lo drinks may not reach the people that they could benefit the most. Less advantaged groups experience higher levels of alcohol-related harm than those who are more advantaged, despite being less likely to drink alcohol and having lower average alcohol consumption if they do [11, 12]. Therefore, no/lo drinks may

have limited potential to reduce alcohol-related harms and may contribute to the persistence or widening of health inequalities. There is also limited evidence on whether no/lo drinks are consumed as a substitute for, or as an addition to, standard alcoholic drinks and among different population groups. Some studies suggest that no/lo drinks are used to replace alcoholic drinks including among heavier alcohol consumers [7–17]. However, one report found that between 20% and 35% of drinkers consume no/lo drinks in addition to their existing consumption and this was particularly common among heavier drinkers [2].

There is a need for a larger and more up-to-date evidence base to inform understanding of how, and to what extent, no/lo drinks can contribute to reducing alcohol-related harm and associated health inequalities. This includes evidence on different frequencies of no/lo consumption, and the extent to which no/lo drinks are consumed alongside standard alcoholic drinks, in the on-trade (e.g., pubs, bars, nightclubs and restaurants) and in the off-trade (e.g., at home). Data on the frequency of no/lo consumption is important to provide a more detailed picture of patterns of no/lo consumption, and among different population groups, and to anticipate the potential public health impact of these consumption patterns. For example, one report found that most people who reported consuming no/lo drinks did so only occasionally, and that this infrequent use might limit the potential for no/lo drinks to reduce alcohol consumption [2]. Evidence is also needed on additional sociodemographic and behavioural characteristics of individuals that may be associated with consuming no/lo drinks, including urbanity and smoking and vaping status. For example, previous research suggests that being able to drive home from social events is a popular reason for drinking no/lo products [2]. However, it is not clear whether this translates into more frequent no/lo consumption among those living in rural locations who may have reduced access to public transport. Additionally, to date, there is no evidence of whether the use of no/lo drinks is more common among those who smoke and/or use e-cigarettes. Such data could improve understanding of shifts in co-occurring health risk factors (i.e., alcohol and smoking) and/or use of harm reduction products.

1.1 | Aims

Using individual-level survey data collected during 2022 and 2023, this study aimed to estimate among adults in Great Britain:

1. The proportions who have ever consumed no/lo drinks or do so weekly, and whether those who have

ever consumed no/lo drinks do so alongside standard-alcohol products, in the off-trade, and in the on-trade.

2. The associations between consuming no/lo drinks ever or weekly and individuals' sociodemographic characteristics and their wider alcohol and smoking behaviours.

2 | METHODS

The data analysis plan was pre-registered on the Open Science Framework on 28 March 2023: https://osf.io/4g6ja/.

2.1 | Data

This study used pooled data from four waves (August and October 2022, February and April 2023) of a repeat cross-sectional survey in Great Britain, the Alcohol Toolkit Study. The Alcohol Toolkit Study is a monthly nationally representative survey on alcohol use behaviours among people aged 16 and older who are resident in Great Britain ($N \approx 1700$ in England, $N \approx 450$ in Scotland and $N \approx 300$ in Wales each month). The study uses a hybrid of random probability and simple quota sampling. Data are collected via computer assisted telephone interviews, managed by Ipsos MORI and anonymised to the researchers. Detailed methods are described elsewhere [18, 19].

The number of waves used for analysis was based on an a priori power calculation using the *popower* function in the Hmisc R package, which showed that a sample size of 7350 would allow us to detect odds ratios ≥1.2 at 88% power in a two-tailed comparison between two samples [20]. The four waves included here provided an unweighted sample of $N = 7691$.

2.2 | Measures

2.2.1 | Outcome measures: Frequency of no/lo consumption

The questions measuring frequency of no/lo consumption were based on the frequency of alcohol consumption measure used in the Health Survey for England [21]. We asked respondents to indicate how often they consume *'an alcohol-free or low alcohol drink, that is, beer, wine, cider, spirits or other type of alcoholic drink under 1.2% ABV'* (response options: 'never', 'once or twice a year', 'once every couple of months', 'once or twice a month', 'once or twice a week', 'three or four days a week', 'five or six days a week', 'almost every day'). Using the same response

options, we asked those who reported ever consuming no/lo drinks to indicate how often they did so *'during the same occasion that you also drink standard alcoholic drinks'*, *'in a pub, club, bar or restaurant'* (on-trade), and *'in your home or someone else's home'* (off-trade).

For the analyses of ever consuming no/lo drinks, response options were collapsed into no consumption (never) and ever consumption (all other responses). For the analyses of weekly no/lo consumption, response options were collapsed into less than weekly consumption (never, once or twice a year, once every couple of months, once or twice a month) and weekly consumption (once or twice a week, three or four days a week, five or six days a week, almost every day).

We used these questions to create eight outcome measures: percentage of ever and weekly consumption of no/lo drinks among all respondents; and then among ever no/lo consumers, the percentage who consume no/lo drinks ever and weekly alongside standard alcoholic drinks, in the on-trade and in the off-trade.

2.2.2 | Sociodemographics

The sociodemographic variables were gender (man, woman, other), age (16–24, 25–34, 35–44, 45–54, 55–64, 65+), ethnicity (White, mixed, Asian, Black, other), region (nine government office regions in England, and Scotland and Wales), urbanity (urban, rural), social grade (measured using the National Readership Survey social grade system and collapsed into AB, C1, C2, DE [22]), education (no formal qualifications, age-16 qualifications, post-16 qualifications, university qualifications, other) and whether there were children aged below 15 in the household.

2.2.3 | Alcohol and smoking behaviours

Alcohol consumption risk level was measured using the Alcohol Use Disorders Identification Test-Consumption [23]. We categorised Alcohol Use Disorders Identification Test-Consumption scores as non-drinker (0), low risk (1–4) and increasing risk+ (5–12). Smoking status was categorised as current smoker, ex-smoker and never smoker. Use of e-cigarettes was categories as e-cigarette user and non-user.

See Appendix S1 for more details on measures.

2.2.4 | Sample selection

For analyses of ever and weekly no/lo consumption overall, the analytical sample consisted of all respondents.

For analyses of ever and weekly no/lo consumption alongside standard alcoholic products, in the off-trade and in the on-trade, the analytical sample consisted of respondents who reported ever drinking no/lo products. Those who provided inconsistent responses regarding frequency of no/lo consumption were excluded from all analyses (e.g., those who reported never consuming no/lo drinks but also reported consuming no/lo drinks in the off-trade on a weekly basis, $N = 456$). See Appendix S2 for details of those excluded for giving inconsistent responses.

2.2.5 | Handling missing data

A total of 927 (12.1%) of cases had missing data on at least one variable. We found that data were not missing completely at random (Little's Missing Completely At Random test: $\chi^2 = 792.779$, DF = 519, p value ≤ 0.001) so we used multiple imputation as the least biased approach to handling missing data [24–26]. In accordance with guidance, the multiple imputation model included 12 imputations and all the variables used in the study [27].

2.2.6 | Statistical methods

First, we conducted descriptive analyses of each outcome measure. Second, we conducted adjusted multivariate logistic regression analyses to test for associations between each of the eight outcome measures and the sociodemographic and behavioural variables. Data were analysed in SPSS version 28.0. Significance tests were two-tailed and alpha was set at 0.05. Weighted data were used in all analyses.

2.2.7 | Changes from the published analysis plan

We made five changes to the published analysis plan (https://osf.io/4g6ja/). First, we weighted the data in all analyses. Second, we planned to use ordinal logistic regressions that used the full range of frequencies in our outcome measures, but the assumption of proportional odds was violated. After testing multinomial regression models as an alternative, we chose to use simpler binary logistic regression models as the results would be more comprehensible to stakeholders. Third, for the same reason, we decided not to look at the differences in characteristics of no/lo consumers according to Alcohol Use Disorders Identification Test-Consumption category. Fourth, due to low frequencies, we added a fourth wave

of data (April 2023) and combined the education variable response options 'still studying' and 'other'. Fifth, we analysed the data in SPSS Version 28.0 rather than in R.

3 | RESULTS

Table 1 provides a summary of the sample characteristics.

3.1 | Proportion of respondents consuming no/lo drinks

Overall, 31.3% of respondents reported ever consuming no/lo drinks and 9.8% reported doing so on a weekly basis. Among ever no/lo consumers, 46.1% ever consumed no/lo drinks alongside standard alcoholic drinks and 11.7% did so on a weekly basis, 60.2% ever drank no/lo drinks in the on-trade and 7.3% did so on a weekly basis, and 67.9% ever drank no/lo drinks in the off-trade and 16.7% did so on a weekly basis (Table 1).

3.2 | Associations between overall no/lo consumption and sociodemographic and behavioural characteristics

Ever consuming no/lo drinks was more likely among those aged 16–24 compared with those aged 65 and older, those living in rural compared with urban areas, those who consumed alcohol at a low risk or increasing risk+ level rather than being a non-drinker, and those who used to smoke compared with those who have never smoked (Table 2). Respondents were less likely to consume no/lo drinks if they were living in Yorkshire and the Humber or Scotland compared with the South-East (a more affluent region of England), if they were in the lowest compared with the highest social grade, if they did not have university qualifications compared with having university qualifications, if they smoked compared with having never smoked, and if they used e-cigarettes compared with non-use.

Weekly consumption of no/lo drinks was more likely among men, those who consumed alcohol at a low risk or increasing risk+ level rather than being a non-drinker, and those who used to smoke compared with having never smoked (Table 2). It was less likely among those aged 16–54 compared with 65 or older; living in the North-West, Yorkshire and the Humber, the West Midlands, the East of England, or Scotland compared with the South-East; if they were in the lowest two, compared with the highest, social grades; if they had no formal qualifications, age-16 qualifications or 'other' qualifications rather than university

TABLE 1 Sample characteristics, and proportions of respondents reporting ever and weekly no/lo consumption overall, alongside standard alcoholic drinks, in the on-trade, and in the off-trade (weighted data).

Characteristic	%	N[a]	Ever no/lo consumption				Weekly no/lo consumption			
			Overall[b]	Alongside standard[c]	On-trade[c]	Off-trade[c]	Overall[b]	Alongside standard[c]	On-trade[c]	Off-trade[c]
Overall			31.3	46.1	60.2	67.9	9.8	11.7	7.3	16.7
Gender										
Man	50.3	4035	32.6	46.5	60.8	67.2	11.1	13.7	8.2	18.0
Woman	49.0	4141	30.2	45.6	59.6	68.5	8.5	9.4	6.1	15.2
Other	0.6	51	27.3	59.6	53.6	69.9	8.9	23.5	24.1	23.5
Age, years										
16–17	1.8	145	40.0	68.4	41.4	84.2	6.3	3.5	1.7	8.6
18–24	12.2	1001	30.5	55.4	60.9	63.6	9.0	10.5	8.9	9.9
25–34	17.1	1404	31.9	48.0	61.9	64.7	8.8	11.4	8.0	14.1
35–44	15.8	1298	34.3	45.4	67.2	69.7	8.0	9.2	7.8	15.7
45–54	16.4	1346	30.1	44.6	64.0	70.1	13.1	9.9	4.7	17.1
55–64	15.0	1231	30.8	45.4	58.0	71.2	12.5	15.6	8.7	23.0
65+	21.9	1802	29.8	38.9	53.3	65.6	6.3	14.0	7.1	19.4
Ethnicity										
White	84.7	6971	32.0	44.2	60.6	67.9	10.3	11.8	7.5	17.6
Mixed	2.7	224	30.8	61.0	63.6	77.0	8.4	10.2	6.6	7.6
Asian	5.9	485	22.1	47.6	49.5	57.2	6.0	10.9	4.2	10.8
Black	5.2	428	32.7	66.6	60.5	71.0	7.8	11.1	6.0	11.2
Other	1.4	119	24.9	52.9	61.2	67.8	6.9	9.5	9.7	14.3
Region										
North East	4.4	365	29.9	45.9	63.3	70.6	9.3	13.6	4.6	20.2
North West	11.9	983	29.8	44.4	57.5	60.4	8.9	9.2	5.8	12.3
Yorkshire and The Humber	8.9	736	27.6	38.9	57.4	64.7	8.4	9.4	8.4	17.6
East Midlands	8.0	656	28.6	47.9	55.6	69.0	9.3	14.9	9.0	17.6
West Midlands	9.5	781	29.2	46.5	63.6	65.8	8.1	7.9	6.6	18.8
East of England	10.3	845	30.7	52.1	59.8	71.0	7.8	12.0	6.6	13.9
London	14.6	1201	35.3	48.3	59.0	65.8	12.1	13.7	7.8	17.2
South East	14.8	1215	34.8	44.9	59.8	74.5	12.1	12.5	7.6	18.7
South West	9.1	748	33.7	46.8	64.7	68.7	11.0	12.3	8.7	18.3
Wales	3.1	257	27.2	52.2	62.9	64.3	10.9	15.7	7.1	17.4
Scotland	5.4	440	29.0	37.8	64.8	68.0	7.0	7.1	5.5	10.2
Urbanity										
Rural	18.7	1537	34.5	39.5	56.6	69.8	9.8	10.4	5.3	14.5
Urban	81.3	6690	30.6	47.8	61.1	67.4	9.8	12.0	7.8	17.2
Social grade										
AB	27.0	2220	36.7	46.4	65.9	72.3	13.0	13.1	7.5	18.7
C1	26.1	2147	32.6	45.1	63.9	68.7	10.6	11.4	7.7	18.3
C2	21.6	1776	29.3	51.8	57.6	67.7	7.9	13.4	8.2	14.2
DE	25.3	2084	26.0	41.5	49.3	60.2	7.2	8.2	5.5	13.8

(Continues)

TABLE 1 (Continued)

Characteristic	%	N[a]	Ever no/lo consumption				Weekly no/lo consumption			
			Overall[b]	Alongside standard[c]	On-trade[c]	Off-trade[c]	Overall[b]	Alongside standard[c]	On-trade[c]	Off-trade[c]
Highest qualifications										
No formal quals[d]	8.0	658	19.0	44.7	38.8	57.2	6.1	6.5	3.3	9.9
Age-16 quals	20.8	1715	28.0	44.4	55.9	63.9	8.1	10.0	6.5	13.0
Post-16 quals	20.0	1648	30.2	46.6	62.7	63.2	8.6	13.0	7.4	14.9
University quals	44.3	3644	36.0	46.7	62.6	72.0	12.1	11.6	7.8	19.5
Other	6.8	562	29.1	45.5	62.8	68.6	8.1	16.3	8.0	15.7
Children <15 in household										
Yes	29.0	2390	32.1	48.0	59.9	69.2	8.1	9.1	5.7	14.5
No	71.0	5837	31.0	45.3	60.3	67.3	10.5	12.8	8.0	17.6
Alcohol consumption										
Low risk	68.3	5617	28.2	45.3	60.2	66.7	7.8	8.8	5.9	14.4
Increasing risk	20.4	1677	41.0	47.9	64.0	73.2	13.7	15.0	8.2	19.1
Higher risk	9.2	754	33.3	46.4	51.8	61.4	15.7	19.6	11.9	23.2
Possible dependence	2.2	180	28.8	45.9	51.1	63.4	11.3	18.9	15.3	21.5
Smoking status										
Current smoker	16.6	1366	26.3	43.7	52.5	61.6	8.5	14.6	10.1	15.5
Ex smoker	24.5	2013	34.5	43.1	56.4	67.9	12.0	11.1	6.5	20.0
Never smoker	58.9	484	31.4	48.1	63.7	69.3	9.3	11.3	7.0	15.4
E-cigarette use										
Non-user	89.1	7330	31.6	46.3	60.7	68.7	10.2	11.9	7.3	17.1
E-cigarette user	10.9	897	28.8	44.4	55.6	60.9	6.5	9.7	6.6	13.2

[a]Figures may not add up to 8227 or 100% because of rounding.
[b]N = 8227 (full sample).
[c]N = 2576 (ever no/lo consumers only).
[d]Qualifications.

qualifications; and if they used e-cigarettes compared with non-use.

3.3 | Associations between no/lo consumption alongside standard alcoholic drinks and sociodemographic and behavioural characteristics

Among ever no/lo consumers, ever consuming no/lo drinks alongside standard alcoholic drinks was more likely among those aged 16–34 compared with 65 or older, those living in the East of England compared with the South-East, and those who consumed standard alcoholic drinks at a level of low risk or increasing risk+ compared with being a non-drinker (Table 3). It was less likely among those from a racialised minority compared with being White, and those who lived in a rural rather than an urban area.

Among ever no/lo consumers, weekly consumption of no/lo drinks alongside standard alcoholic drinks was more likely among men, and those who consumed alcohol at a low risk or increasing risk+ level compared with being a non-drinker. Conversely, it was less likely among those aged 16–24 or 35–54 compared with those aged 65 or older (Table S1).

3.4 | Associations between no/lo consumption in the on-trade and sociodemographic and behavioural characteristics

Among ever no/lo consumers, ever consumption of no/lo drinks in the on-trade was more likely among those who were aged 25–54 compared with 65 or older, and consumed alcohol at a low risk or increasing risk+ level

compared with being a non-drinker (Table 3). It was less likely among those living in rural rather than urban areas; those in the lowest two, compared with the highest, social grades; those who had no formal qualifications compared with university qualifications; those who had children aged under 15 in the household; and those

TABLE 2 Associations between ever and weekly no/lo consumption and respondent characteristics (weighted data, $N = 8227$).

Characteristic/category	Ever no/lo consumption				Weekly no/lo consumption			
	OR[a]	95% CIs		p-value	OR	95% CIs		p-value
Gender: (Ref: Woman)								
Man	1.06	0.96	1.17	0.272	**1.23**	**1.05**	**1.43**	**0.009**
Age, years: (Ref: 65+)								
16–24	**1.29**	**1.07**	**1.57**	**0.009**	**0.52**	**0.38**	**0.71**	**<0.001**
25–34	1.17	0.99	1.40	0.070	**0.69**	**0.53**	**0.89**	**0.004**
35–44	1.16	0.96	1.39	0.116	**0.62**	**0.47**	**0.81**	**0.001**
45–54	0.93	0.78	1.10	0.385	**0.54**	**0.41**	**0.70**	**<0.001**
55–64	1.00	0.84	1.18	0.959	0.97	0.77	1.22	0.782
Ethnicity: (Ref: White)								
Racialised minorities	1.00	0.84	1.18	0.962	1.08	0.82	1.41	0.595
Region: (Ref: South East)								
North East	0.85	0.65	1.11	0.239	0.70	0.47	1.05	0.084
North West	0.84	0.70	1.02	0.077	**0.72**	**0.54**	**0.96**	**0.023**
Yorkshire and the Humber	**0.75**	**0.61**	**0.93**	**0.007**	**0.69**	**0.50**	**0.95**	**0.023**
East Midlands	0.82	0.66	1.02	0.074	0.75	0.54	1.04	0.088
West Midlands	0.85	0.70	1.05	0.133	**0.68**	**0.50**	**0.94**	**0.020**
East of England	0.87	0.72	1.06	0.166	**0.64**	**0.47**	**0.87**	**0.004**
London	1.07	0.89	1.28	0.480	1.02	0.79	1.32	0.880
South West	0.95	0.78	1.16	0.630	0.86	0.64	1.16	0.327
Wales	0.75	0.55	1.02	0.070	0.88	0.57	1.36	0.568
Scotland	**0.76**	**0.60**	**0.98**	**0.031**	**0.54**	**0.36**	**0.81**	**0.003**
Urbanity: (Ref: Urban)								
Rural	**1.14**	**1.00**	**1.29**	**0.044**	0.93	0.76	1.13	0.444
Social grade: (Ref: AB)								
C1	0.91	0.79	1.04	0.158	0.89	0.73	1.09	0.257
C2	0.87	0.74	1.01	0.063	**0.68**	**0.52**	**0.88**	**0.003**
DE	**0.85**	**0.73**	**1.00**	**0.049**	**0.74**	**0.57**	**0.94**	**0.016**
Education: (Ref: University quals[b])								
No formal quals	**0.57**	**0.45**	**0.72**	**<0.001**	**0.54**	**0.37**	**0.78**	**0.001**
Age-16 quals	**0.77**	**0.66**	**0.88**	**<0.001**	**0.73**	**0.59**	**0.92**	**0.007**
Post-16 quals	**0.82**	**0.71**	**0.95**	**0.006**	0.84	0.67	1.04	0.116
Other	**0.80**	**0.65**	**0.99**	**0.040**	**0.69**	**0.49**	**0.97**	**0.031**
Children <15 in household: (Ref: No)								
Yes	1.08	0.95	1.21	0.233	0.95	0.78	1.16	0.613
Alcohol consumption: (Ref: Non-drinker)								
Low risk	**3.79**	**3.22**	**4.47**	**<0.001**	**2.03**	**1.58**	**2.61**	**<0.001**
Increasing risk +[c]	**3.96**	**3.27**	**4.80**	**<0.001**	**3.23**	**2.49**	**4.19**	**<0.001**

(Continues)

T A B L E 2 (Continued)

Characteristic/category	Ever no/lo consumption				Weekly no/lo consumption			
	OR[a]	95% CIs		p-value	OR	95% CIs		p-value
Smoking status: (Ref: Never smoker)								
Current smoker	0.84	0.72	0.98	0.025	1.09	0.86	1.38	0.463
Ex smoker	1.19	1.05	1.34	0.005	1.31	1.09	1.56	0.003
E-cigarette use: (Ref: Non-user)								
E-cigarette user	0.84	0.70	1.00	0.049	0.64	0.48	0.87	0.004

Note: Bold font: *p*-value <0.05.
Abbreviations: CI, confidence interval; OR, odds ratio.
[a]Odds ratio adjusting for all variables in the model.
[b]Qualifications.
[c]Increasing risk/higher risk/possible dependence.

who currently or used to smoke compared with having never smoked.

There were no significant associations for weekly consumption of no/lo drinks in the on-trade (Table S1).

3.5 | Associations between no/lo consumption in the off-trade and sociodemographic and behavioural characteristics

Among ever no/lo consumers, ever consumption of no/lo drinks in the off-trade was less likely among those living in the North-West of England, Yorkshire and the Humber or London compared with the South-East; who were in the lowest, compared with highest, social grade; and who had no formal qualifications, age-16 qualifications or post-16 qualifications compared with university qualifications (Table 3).

Among ever no/lo consumers, weekly consumption of no/lo drinks in the off-trade was less likely among those aged 16–34 compared with those aged 65 and older, those living in the North-West of England or Scotland compared with the South-East, those with no formal qualifications or age-16 qualifications compared with university qualifications, and those who drank alcohol at a low-risk level compared with being a non-drinker (Table S1).

4 | DISCUSSION

This study estimated the proportions of adults in Great Britain who consume no/lo drinks, and consume them on a weekly basis, in different settings and the associations between frequency of no/lo consumption and individual's sociodemographic and wider behavioural characteristics.

Similar to findings from previous research, this study found that a significant minority of adults in Great Britain had ever consumed no/lo drinks, that those who consumed no/lo drinks only did so occasionally, and that no/lo drinks were more commonly consumed in the off-trade than the on-trade [2, 6]. The latter finding may be indicative of the wider range and lower cost of no/lo products available in the off-trade compared with the on-trade [6]. That no/lo drinks are used infrequently also suggests they are unlikely to be making a substantial contribution currently to reducing alcohol consumption in Great Britain [2].

Those who ever consumed no/lo drinks and those who did so weekly had broadly similar characteristics. Ever and weekly no/lo consumption were more common among those who were more socially advantaged, those consuming more alcohol, those living in southern regions of England including London, and those not consuming nicotine products. However, there were contrasting findings for gender, age and rurality. There was no significant difference between ever consumption of no/lo drinks among men and women, however, men were more likely to report weekly no/lo consumption. Although ever consumption of no/lo drinks was more common among those who were younger and those living in rural areas, weekly no/lo consumption was more common among those who were older and those living in urban areas. Overall, these findings align with previous studies, which suggest that no/lo products are most likely to be consumed by those who are more socially advantaged, and those who drink other alcohol products and are heavier alcohol consumers [2, 7–10]. Our finding that consumption of no/lo drinks tends to be less common among those who use nicotine products is novel but aligns with the evidence on social advantage as nicotine use is also less common in advantaged groups [28].

The no/lo market is still developing, and frequent no/lo consumption may be more common among men

TABLE 3 Associations between ever no/lo consumption alongside standard alcoholic drinks, in the on-trade and in the off-trade, and respondent characteristics (weighted data, $N = 2576$).

Characteristic/category	Alongside standard alcohol			In the on-trade			In the off-trade		
	OR[a]	95% CIs	*p*-value	OR	95% CIs	*p*-value	OR	95% CIs	*p*-value
Gender: (Ref: Woman)									
Man	1.02	0.86 1.20	0.827	1.04	0.88 1.24	0.626	0.92	0.77 1.09	0.330
Age, years: (Ref: 65+)									
16–24	**1.98**	**1.43 2.73**	**<0.001**	1.34	0.97 1.86	0.078	1.17	0.84 1.64	0.350
25–34	**1.39**	**1.05 1.86**	**0.023**	**1.59**	**1.19 2.13**	**0.002**	0.94	0.70 1.27	0.697
35–44	1.22	0.91 1.65	0.184	**2.03**	**1.49 2.76**	**<0.001**	1.13	0.82 1.55	0.448
45–54	1.17	0.87 1.56	0.292	**1.65**	**1.23 2.22**	**0.001**	1.13	0.83 1.54	0.426
55–64	1.28	0.96 1.70	0.090	1.20	0.91 1.60	0.200	1.20	0.89 1.62	0.238
Ethnicity: (Ref: White)									
Racialised minorities	**0.62**	**0.47 0.81**	**<0.001**	1.20	0.92 1.57	0.173	0.95	0.72 1.25	0.707
Region: (Ref: South East)									
North East	1.10	0.72 1.71	0.654	1.28	0.81 2.01	0.293	0.88	0.54 1.41	0.588
North West	0.96	0.70 1.31	0.782	0.89	0.65 1.22	0.460	**0.54**	**0.39 0.76**	**<0.001**
Yorkshire and the Humber	0.78	0.55 1.11	0.170	0.90	0.63 1.27	0.539	**0.63**	**0.44 0.92**	**0.015**
East Midlands	1.08	0.75 1.55	0.676	0.85	0.59 1.23	0.395	0.81	0.55 1.20	0.288
West Midlands	0.99	0.71 1.39	0.975	1.12	0.80 1.59	0.507	0.71	0.49 1.01	0.059
East of England	**1.40**	**1.02 1.93**	**0.038**	1.04	0.75 1.44	0.808	0.89	0.63 1.27	0.538
London	0.98	0.74 1.31	0.910	0.91	0.68 1.22	0.522	**0.66**	**0.49 0.91**	**0.010**
South West	1.18	0.86 1.64	0.309	1.31	0.94 1.84	0.111	0.75	0.53 1.07	0.114
Wales	1.50	0.89 2.52	0.130	1.23	0.72 2.13	0.447	0.63	0.36 1.08	0.095
Scotland	0.77	0.51 1.16	0.213	1.27	0.83 1.94	0.277	0.71	0.46 1.10	0.121
Urbanity: (Ref: Urban)									
Rural	**0.71**	**0.58 0.88**	**0.001**	**0.78**	**0.64 0.96**	**0.023**	1.06	0.85 1.32	0.629
Social grade: (Ref: AB)									
C1	0.94	0.76 1.18	0.609	0.92	0.71 2.01	0.510	0.91	0.72 1.15	0.432
C2	1.27	0.97 1.66	0.082	**0.74**	**0.56 0.96**	**0.023**	0.93	0.71 1.21	0.582
DE	0.85	0.65 1.10	0.217	**0.60**	**0.45 0.81**	**0.001**	**0.72**	**0.55 0.95**	**0.018**
Education: (Ref: University quals[b])									
No formal quals	1.23	0.81 1.87	0.334	**0.92**	**0.40 0.95**	**0.027**	**0.64**	**0.42 0.99**	**0.044**
Age-16 quals	0.87	0.68 1.10	0.243	0.74	0.76 1.24	0.816	**0.75**	**0.58 0.95**	**0.019**
Post-16 quals	0.89	0.70 1.12	0.302	0.60	0.96 1.54	0.107	**0.70**	**0.55 0.89**	**0.004**
Other	1.02	0.71 1.45	0.925	1.29	0.90 1.86	0.166	0.90	0.62 1.31	0.591
Children <15 in household: (Ref: No)									
Yes	1.09	0.90 1.33	0.376	**0.81**	**0.67 1.00**	**0.045**	1.06	0.87 1.31	0.556
Alcohol consumption: (Ref: Non-drinker)									
Low risk	**2.32**	**1.68 3.19**	**<0.001**	**1.97**	**1.48 2.63**	**<0.001**	1.06	0.79 1.43	0.676
Increasing risk+[c]	**2.24**	**1.61 3.13**	**<0.001**	**1.61**	**1.19 2.18**	**0.002**	1.22	0.89 1.66	0.214
Smoking status: (Ref: Never smoker)									
Current smoker	0.84	0.65 1.10	0.208	**0.65**	**0.50 0.85**	**0.001**	0.82	0.63 1.08	0.153
Ex smoker	0.93	0.76 1.13	0.474	**0.76**	**0.62 0.93**	**0.008**	1.01	0.82 1.25	0.904

(Continues)

TABLE 3 (Continued)

Characteristic/category	Alongside standard alcohol			In the on-trade			In the off-trade		
	OR[a]	95% CIs	*p*-value	OR	95% CIs	*p*-value	OR	95% CIs	*p*-value
E-cigarette use: (Ref: Non-user)									
E-cigarette user	0.86	0.64 1.15	0.303	1.00	0.74 1.34	0.983	0.79	0.59 1.07	0.129

Note: Bold font: *p*-value <0.05.
Abbreviations: CI, confidence interval; OR, odds ratio.
[a]Odds ratio adjusting for all variables in the model.
[b]Qualifications.
[c]Increasing risk/higher risk/possible dependence.

because some of the most prominent marketing campaigns have been for no/lo beers, no/lo beers may more accurately mimic the taste and other sensorial properties of their standard-strength counterparts, the majority of no/lo sales come from beers, and men in Great Britain consume more beer than women [6, 7, 29]. However, evidence suggests that no/lo wine and spirits are marketed towards women, meaning that regular no/lo consumption among women may increase as the market for these products develops [7].

In the current study, ever and weekly consumption of no/lo drinks were both more common among heavier alcohol consumers. Although some evidence suggests the overall impact of no/lo drinks is to facilitate reductions in alcohol consumption [5, 6, 24–27], data from a previous UK survey suggest that moderate and heavy drinkers are more likely than non- or light drinkers to consume no/lo products as an addition to standard alcoholic drinks [2]. However, there is a need for further evidence from a wider range of timepoints, countries, datasets and methodologies to assess whether, in what circumstances and by whom no/lo drinks are used as an addition to, or a substitution for, standard alcoholic drinks – and what the overall public health impact of this is.

Previous studies have found contradictory evidence on the age of no/lo consumers. Studies from the UK and Great Britain found that no/lo consumption was most common among those who were younger, whereas a study from Finland found it to be most common among those who were older [2, 8, 10]. The current study provides additional insights into the frequency of no/lo consumption among people of different ages. Ever consumption of no/lo drinks was more common among those who were younger, whereas weekly no/lo consumption was most common among those who were older. This suggests that although no/lo consumption is less common among older people, there is a subset of older no/lo consumers who frequently consume these products. These findings appear to align with data that suggest those who are older drink standard alcoholic

drinks more frequently than those who are younger [30]. Combined, these data suggest that at least a subset of those who are older are regularly consuming both no/lo drinks and standard alcoholic drinks. As above, further analyses are needed that examine whether older people are more likely than younger people to use no/lo drinks as a substitute for standard alcoholic drinks.

Of concern are trends indicating that ever no/lo consumption, and weekly no/lo consumption, were more common among those who were more advantaged. This was evidenced across a range of measures including those of higher social grades, with higher levels of education, and from more affluent regions. These data suggest that those who are less advantaged may not receive any potential benefits of no/lo products compared with those who are more advantaged. This is of public health concern as those who are less socially advantaged already experience greater levels of alcohol-related harm than those who are more socially advantaged, despite drinking less alcohol on average [11, 12]. If the potential benefits of no/lo drinks accrue mainly to advantaged groups, this is likely to widen existing health inequalities. However, this is based on the assumption that drinking no/lo products is beneficial, for example no/lo drinks being used as a substitute for standard alcoholic drinks, for which more evidence is needed.

4.1 | Strengths and limitations

The main strengths of this study are that it is the first study to look at who consumes no/lo drinks using a robustly sampled individual-level survey of adults. Furthermore, it is the first study to look at who consumes no/lo drinks at different frequencies and in different contexts. As such, it offers the most detailed insights into the characteristics of no/lo consumers to date. One of the main limitations is that there were low frequencies for some of the survey questions' response options. This resulted in wide confidence intervals in the regression

analyses, which may limit the precision of our findings. We also did not distinguish in the survey questions or analyses between alcohol-free and low-alcohol products as our budget did not allow for separate questions, although it is unclear how well respondents could differentiate between these categories and the former make up a large majority of no/lo sales.

4.2 | Implications

If the UK Government and public health actors aim to increase consumption of no/lo drinks to reduce the harm and health inequalities caused by alcohol, they need to identify ways to increase no/lo consumption among less advantaged groups who experience the highest rates of harm. Future research should seek to understand why no/lo consumption is lower in less advantaged groups, the role of prices in uptake as these tend to be higher for no/lo drinks than standard alcoholic drinks (or no/lo drinks perceived as lower value for money), and the effectiveness of targeted social media and/or individualised interventions [6]. However, this is premised on the assumption that uptake of no/lo drinks leads to them being used as a substitute for standard alcoholic drinks, for which more evidence is also needed. More generally, there is the need to continue monitoring the growing no/lo drinks market and to develop a greater evidence base on no/lo products, who consumes them, in what contexts and why.

5 | CONCLUSION

A significant minority of people in the UK drink no/lo products. No/lo consumption, and weekly no/lo consumption, is more common among those who are heavier drinkers and who are more socially advantaged. No/lo products may benefit heavier drinkers if they are consumed as a substitute for standard alcoholic drinks. However, their higher use among those who are more socially advantaged means they may sustain or widen health inequalities. Future no/lo policies should go beyond simply increasing availability: policymakers should consider tailoring approaches to those who are already at elevated risk of alcohol-related harm.

AUTHOR CONTRIBUTIONS

Each author certifies that their contribution to this work meets the standards of the International Committee of Medical Journal Editors.

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None.

ETHICS STATEMENT
Ethical approval for the Alcohol Toolkit Study was granted by the UCL Ethics Committee (ID 0498/001). The ethical approval process covers the additional no/lo questions.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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