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# Alcohol marketing on social media: young people's exposure, engagement and alcohol-related behaviors

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**ABSTRACT**

**Aim:** Alcohol promotions in conventional channels are associated with subsequent alcohol consumption in young people, but little is known about young people's exposure to digital alcohol marketing. This exploratory study investigated young people's exposure to, and engagement with, alcohol marketing on social media platforms, variations across sociodemographic groups and associations with alcohol-related behaviors.

**Method:** An online survey was conducted with 3698 participants aged between 14 and 20 years ($M = 17.1$; SD = 1.8) in New Zealand. The survey asked about social media use and exposure to and engagement with alcohol product marketing on their preferred platforms, alcohol consumption patterns, hazardous drinking (AUDIT-C scores) and purchasing alcohol online.

**Results:** Nearly three-quarters of the sample who responded to questions about exposure to alcohol marketing (70.6%; $n = 1541$) reported seeing marketing on at least one social media platform, with older respondents (18–20 years) more likely to report exposure than younger respondents (14–17 years); no differences were found across gender, ethnicity or socioeconomic groups. Over one-third of those who responded to questions about engagement (40.7%; $n = 850$) reported engaging with alcohol marketing and this varied by age, gender and ethnicity. Recall of exposure to alcohol marketing was less strongly associated with online purchase and having ever drunk alcohol than was engagement with alcohol marketing, which was also associated with hazardous drinking.

**Conclusions:** Engagement with alcohol marketing was more strongly related to alcohol behaviors, including online purchasing, having ever drunk alcohol, and drinking at hazardous levels, than exposure. These findings also demonstrated inequitable patterns of engagement with alcohol marketing on social media associated with these novel algorithmic marketing methods.

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## Introduction

Public health alcohol science has long been concerned about the role of marketing in increasing overall consumption of alcohol (Casswell et al. 1989; McCreanor et al. 2008; Jernigan et al. 2017; Babor et al. 2023). Alcohol is a dose-related toxin heavily implicated in the global burden of disease (Babor et al. 2023), damaging multiple human biological, psychological and social systems. However in many cultures it is also regarded as a social lubricant, a legitimate source of income and a key player in many contemporary economies and societies (Lyons and Kersey 2020; Babor et al. 2023). Early on, alcohol companies created partnerships with technology companies as they developed social media platforms (Carah 2017), and the alcohol industry was an early adopter of social media marketing in the second decade of the current century (Mosher 2012; McCreanor et al. 2013).

A wealth of evidence has demonstrated a reliable relationship between exposure to alcohol marketing in traditional domains and alcohol consumption, particularly in young people (Jernigan et al. 2017; Babor et al. 2023). Researchers have recently argued that there is enough evidence to conclude that exposure to alcohol promotions in conventional channels is *causal* of subsequent alcohol consumption in young people in a dose-effect relationship (Sargent and Babor 2020). Using the Bradford Hill framework and criteria, Sargent and Babor (2020) synthesized a comprehensive collection of commissioned studies (and other research literature) from alcohol science experts and concluded the evidence supports a causal relationship between alcohol marketing and alcohol consumption. This work heralds a major shift in the position of public health research and has led to momentum for arguments around an international framework convention (with a component similar to Article

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13 of the WHO Framework Convention on Tobacco Control; WHO 2003). However, there is now much alcohol marketing in the online environment, and we know little about the effects of digital alcohol marketing, and particularly marketing on social media platforms (Sargent and Babor 2020). Babor et al. (2023) have suggested that the impacts are likely to be similar - if not potentially more influential – to conventional alcohol marketing.

Alcohol companies are marketing on social media platforms to appeal to young people, to encourage them to engage with alcohol brands and to increase their alcohol consumption (Roberson et al. 2018; Critchlow et al. 2019; Atkinson et al. 2022). Activities used include exposing young people to alcohol product content online *via* unique affordances such as comments, likes, questions, competitions and sponsorships (Nicholls 2012; Barry et al. 2016, 2018; Jernigan et al. 2017; Lobstein et al. 2017; Bagenal et al. 2023). In Aotearoa New Zealand (NZ) and Australia, alcohol retailers have been found to use social media platforms in strategies such as sponsoring festivals, linking alcohol brands to appealing lifestyles and supporting popular influencers (Carah et al. 2017; Niland et al. 2017; Martino et al. 2021). Such findings question the social responsibility campaigns undertaken by the alcohol industry, and their appeals to 'drink moderately', given that they continue to market their products to young people in digital environments in pervasive and novel ways, and in ways that are occluded from public view. International research suggests that social media have been crucial in publicizing, normalizing and selling alcohol products among young people (Babor et al. 2010; Lyons et al. 2017; Carah and Brodmerkel 2021).

Online marketing that highlights alcohol brands and products as appealing lifestyle accessories within youth cultures is concerning, especially given young peoples' high rates of social media use and its importance to their social worlds. Social media marketing differs from conventional marketing, being algorithmic, participatory, and data-driven, within dynamic social media feeds that are obscured from public view (Carah and Brodmerkel 2021). Quality time spent engaging with brands becomes a novel focus, as this enables marketing content to be prioritized within algorithmically driven social media feeds (Carah and Brodmerkel 2021; Goodwin 2022). While research has examined the digital content of social media marketing, this novel algorithmic mode of dissemination is particularly worrying given that algorithms can measure and stimulate affect, operate to intensify consumer-driven socializing, and deliver advertising that enables the completion of retail purchases (Lyons et al. 2023).

We know very little about how alcohol marketing exposure and engagement affects young people on social media platforms, although understandings of the positive associations among engagement, consumption and harm is growing (Noel et al. 2020). In Aotearoa NZ young people's alcohol consumption patterns have been remarkably similar to those in Australia and other Western societies, with declining levels of alcohol consumption among teenagers over recent years (Ball et al. 2023). However, in Aotearoa NZ reductions in youth consumption have not resulted in reductions in levels of hazardous drinking (Ministry of Health NZ 2022) while in Australia population data show alcohol related deaths at their highest level in a decade and hospitalizations for alcohol related harm up by more than a quarter (FARE 2023). Since 2015 there has also been a steady overall increase in underage drinkers between 15 and 17 in Aotearoa NZ, as well as continued increases in the number of female drinkers (Ministry of Health NZ 2022). These trends have been matched by increases in the number of young people drinking hazardously, and increases in alcohol-related harms (Ministry of Health NZ 2022).

We currently also know little about how the dynamics of exposure and engagement with alcohol marketing might vary across socio-demographic groups and be associated with alcohol-related behaviors, including purchasing alcohol products online. In Aotearoa NZ the *Sale and Supply of Alcohol Act* 2012 states that alcohol cannot be sold to people aged under 18 years, or to people who are intoxicated. The Act does not mention online or digital marketing. Alcohol advertising, including online, is regulated by the Alcohol Advertising and Promotion Code in combination with the Advertising Standards Code. When alcohol is purchased online and delivered (often by delivery services that are independent of the alcohol outlet), compliance is more challenging. Initial research suggests that this is changing local alcohol environments in Aotearoa NZ (Crossin et al. 2024).

The algorithmic marketing models employed by social media platforms places alcohol advertisements within the feeds of people who are predicted as being most likely to engage with it, and may disproportionately target high consumers of alcohol (Goodwin 2022). We also do not know how engagement-driven, algorithmic targeting of alcohol advertising might vary by gender, age, ethnicity or other sociodemographic information. Yet some scholars have argued algorithmic models produce unintentionally biased advertisement delivery, unequally affecting gender and ethnic groups (Chang et al. 2021). Mindful of these gaps in knowledge we designed an exploratory, survey-based study that could, without precisely defining alcohol advertising, draw on the experiential expertise of participants to generate some initial insights into the marketing of alcohol products on social media platforms. Our objectives were to explore whether young people report seeing alcohol marketing on social media and if they do, investigate how it engages them, and whether these experiences varied across sociodemographic groups. We also sought to understand links between young people's behaviors related to alcohol and seeing or engaging with this alcohol marketing, and again to see whether this varied across different sociodemographic groups. Specifically, the current study aimed to:

1. investigate if young people (aged 14–20 years) in Aotearoa NZ recall seeing (being exposed to) and engaging with alcohol marketing and promotion on the social media platforms they regularly use;
2. explore whether exposure to digital alcohol marketing, and engagement with it, varies by age, gender, socioeconomic group, and ethnicity;

3. investigate the prevalence of online purchasing of alcohol, alcohol consumption history and hazardous drinking, and their inter-correlations;
4. examine whether online purchasing, alcohol consumption history and hazardous drinking each varies with sociodemographics, exposure to alcohol marketing on social media, and engagement with this marketing.

## Methods

This was an exploratory, bicultural study that used a questionnaire to obtain information about young people's view and experiences within their digital worlds. The research received ethical approval from the [institution name] Human Ethics Committee.

### Questionnaire

An online questionnaire with six sections was designed and extensively piloted with a diverse range of young people, including Māori, non-Māori, those with a range of ages, genders and socioeconomic backgrounds. The questionnaire included questions about social media use and activity, exposure to and engagement with vape, alcohol and tobacco marketing online, changes in social media use during Covid-19 lockdowns and vaping, drinking and smoking behaviors. For information on survey development, detailed demographic information about the sample, and their Internet and social media use, please see (Lyons et al. 2024).

### Demographic measures

Information was collected on age, gender, ethnicity, sexual orientation, work status, household composition, locality, and parent or caregiver status. Perceived socioeconomic status (SES) was assessed by asking 'how well off economically do you think your whānau/family is' and given five response categories ranging from 'not well off at all', to 'very well off' (Svedberg et al. 2016).

### Social media use

Respondents reported on the social media platforms they used in the previous month (from a list of 18, with open text for any others).

### Recall of exposure to alcohol product marketing online

Respondents were asked if they recalled 'seeing any alcohol product advertising on the following social media' and responded for each of the platforms they had used in the previous month. Exposure response was classified as 'yes' if at least one advert was seen on any platform, and 'no' if no adverts were seen anywhere. This does not capture all of the marketing that participants may have objectively been exposed to, but does capture the marketing they noticed, which was our primary interest in exploring young people's own digital worlds.

### Engagement with alcohol products online

Respondents were asked if they had done any of the following in the past six months: Liked an alcohol brand; Shared a status, picture or video related to an alcohol brand; Followed an alcohol brand; Entered a competition linked to an alcohol brand; Searched for alcohol adverts on websites; used an image filter or effect related to vaping; Engaged with other alcohol brand content. Engagement response was classified as 'yes' if at least one activity was reported, and 'no' if none of these were reported.

### Alcohol purchase online

Respondents were asked if they had purchased alcohol products online.

### Drinking behavior

Respondents were asked if they had 'ever drunk alcohol/used alcohol'; those who said yes were also asked 'how often do you drink now' (Never - I don't drink now; Occasionally; Once or twice a month; Once or twice a week; Most days; Daily).

### Hazardous drinking

The AUDIT-C was used to assess hazardous drinking (Bush et al. 1998). This 3-item measure (consisting of the first 3 items of the 10-item AUDIT scale) asks respondents about their frequency and amount of alcohol consumption, and the number of times they have consumed 6 or more drinks in one sitting across the previous year. A standard drink was defined using the New Zealand Health Promotion definitions (Te Whatu Ora/Health New Zealand 2023) within the question (How many drinks containing alcohol do you have on a typical day when you are drinking? [Count one drink as one can or small bottle of beer, one small glass of wine, one shot of spirits, one ready-made alcoholic drink]). Each question is scored from 0 to 4, with total scores ranging from 0 to 12. Higher scores indicate higher rates of hazardous drinking, with cutoff scores over 5/7 for females/males indicating hazardous drinking in university students (Barry et al. 2015). The AUDIT-C shows sound psychometric properties within a US college sample (Barry et al. 2015).

### Procedure and recruitment

Our aim was to recruit as many young people who used social media as possible to complete the online survey, and for the sample to include 50% Māori participants, as well as participants from a diverse range of gender identities and socio-economic backgrounds. A digital marketing agency was used to recruit respondents aged 16–20 years with these parameters. Survey participants were not intended to be representative of the population, rather the project sought to explore the views and experiences of a large and diverse sample of young people. We worked with youth advisors and a graphic designer to develop digital 'creatives' (brief advertisements) that the social media agency used in their

recruitment. Their goal was to draw a diverse group of 16–20 year olds to the survey landing page. The social media campaign ran over a six-week period in early 2022 on social media platforms (including poll ads on Instagram) and on websites (as banner ads). Clicking on the advertisement led to the survey landing page, which provided the aims of the study and what participation would involve; respondents agreed to take part under these conditions. At the end participants were offered the opportunity to enter a prize draw to win one of six prizes. The social media agency provided updates on the 'conversions' (clicks to survey website) every two weeks, and modified their parameters to obtain the diversity of sample we aimed for. In total 3063 young people aged 16–20 took the survey.

Due to ethical issues around informed consent, we did not use online methods to recruit participants aged 14–15. Instead, high schools across Aotearoa NZ were contacted in 2022, informed about the research, and asked to assist with recruitment. We selected and approached specific high schools to obtain a diverse sample, including those with the majority of students from low-decile socioeconomic backgrounds and those with high proportions of Māori students. Schools who agreed sent out an email to parents and caregivers of Year 10 students outlining the research and ensuring they consented to their young person being sent a link to the online survey, or stating they did not want the survey link to be provided to their young person. The survey link was subsequently sent to relevant students which took them to the same landing page as described above; 731 respondents aged 14–15 completed the survey.

## Participants

Following data screening, the final sample consisted of *3698* participants. The mean age was 17.1 (SD = 1.8), with between 307 and 665 across each age (see Table 1). Participants could select more than one gender identity; 96.2% checked one and 3.8% checked more than one category. Gender responses were recoded into three discrete categories with multiple responses grouped together, as shown in Table 1. Over half the sample identified as female, over a third as male, and 6% as another (or more than one) gender identity. Participants could select more than one ethnicity group; 73.6% selected one ethnicity and 26.4% selected more than one. Where participants selected more than one, we first recoded selection of Māori (the indigenous population of Aotearoa NZ) into the Māori category, and then Pasifika into the Pasifika category, to provide independent groups as shown in Table 1. Almost half the sample were Pākehā/NZ European, with over a quarter identifying as Māori. Most respondents reported that they were heterosexual (68%) with 13% reporting that they were bisexual, and 5% currently unsure of their sexuality. Most lived in cities (68%), with the rest in towns (26%) and in rural locations (6%). Most respondents were students (84%), while a small number (56; 1.4%) were parents.

**Table 1.** Description of the sample ($N = 3698$).

| Age ($N = 3424$) | n | % |
|---|---|---|
| 14 | 386 | 11.3 |
| 15 | 307 | 9.0 |
| 16 | 646 | 18.9 |
| 17 | 586 | 17.1 |
| 18 | 665 | 19.4 |
| 19 | 464 | 13.6 |
| 20 | 370 | 10.8 |
| Gender ($N = 3382$) | | |
| Wahine / tamahine / girl / woman | 1817 | 55.7 |
| Tane / tama / boy / man | 1251 | 38.3 |
| Transgender, agender, non-binary, intersex, something else | 195 | 6.0 |
| Ethnicity ($N = 3365$) | | |
| Māori | 851 | 25.6 |
| Pākehā or New Zealand European | 1552 | 46.7 |
| Pasifika (Samoan, Cook Islands, Tongan, Niuean, Fijian) | 215 | 6.5 |
| Other | 704 | 21.2 |
| Perceived socioeconomic status ($N = 3136$) | | |
| Not well off at all | 153 | 4.1 |
| Not particularly well off | 501 | 13.5 |
| Fairly well off | 1154 | 31.2 |
| Rather well off | 734 | 19.8 |
| Very well off | 192 | 5.2 |
| Prefer not to say | 402 | 10.9 |
| Sexuality ($N = 3309$) | | |
| Straight (heterosexual) | 2236 | 67.6 |
| Gay/lesbian | 117 | 3.6 |
| Bisexual | 440 | 13.3 |
| Queer, pansexual, asexual, something else | 250 | 7.5 |
| Takatapui | 12 | 0.4 |
| Not sure yet | 170 | 5.1 |
| Prefer not to say | 84 | 2.5 |
| Place of residence ($N = 3196$) | | |
| Major city | 1743 | 54.5 |
| Other city | 426 | 13.3 |
| Town | 525 | 16.4 |
| Small town | 306 | 9.6 |
| In the country | 196 | 6.1 |

## Analytic strategy

The online survey data were downloaded and screened carefully. The Qualtrics platform identified potential non-human responses [bots] and these were deleted from the dataset. There were a number of open-ended questions which were checked to ensure their text made sense. Respondents who did not complete the survey beyond the demographics section were also deleted.

Since our aim was to explore mainly nominal data in a nonrandom sample, we used descriptive statistics including percentages, odds ratios and Cramers V correlation coefficients. This $\chi^2$ based coefficient ranges from 0 to 1 and is appropriate for nominal data in bivariate contingency tables with any number of rows and columns. When squared it quantifies the variance shared by the two variables. For the analyses needed to achieve aims 2 and 4 listed above, multivariate techniques were used to control for confounding. Binary logistic regressions were used for all analyses where the dependent variable was a dichotomy. Factorial ANOVA was used to analyze the correlates of hazardous drinking. Interaction effects were also sought but none were found. Two new variables were created for these analyses: age was dichotomized (14–17, 18–20) and SES was trichotomized (low, middle, high). In addition to the descriptive statistics, we also used $p$ values and 95% confidence intervals as rough indicators of nonrandom patterns and precision, respectively. Although we use the term 'statistically significant

($p<.05$)', we view these statistics as exploratory tools to be used in conjunction with the descriptive ones. All analyses were conducted using IBM SPSS Statistics v.20.

## Results

In this section, we first describe the context of young people's digital lives, and then outline the prevalence of young people's exposure to alcohol marketing on social media and their engagement with it, inter-correlations between exposure recall and engagement, and whether reported exposure recall and engagement differ across different groups of young people. We then present a description of reported alcohol behaviors, including prevalence and inter-correlations of purchasing alcohol online, ever having consumed alcohol, and hazardous drinking (AUDIT scores). We then explore if any of these alcohol behaviors are related to sociodemographic variables, alcohol marketing exposure, and alcohol marketing engagement.

### Social media use

The sample were highly digitally connected, as expected, with 97% of respondents reporting being online 'several times a day' or 'almost constantly'. In terms of how they connected to the internet, most used their own smartphones at home (97.2%) and outside the home (94.3%); 80.4% stated this was their most used device. They were high users of social media platforms, using between 1 and 19 different sites in the past month (mean = 5.1; median = 6). The most commonly used platforms were Instagram (92%), YouTube (86%), Snapchat (73%), TikTok (72%), and Facebook (68%) (for further information on the sample's internet and social media use, see (Lyons et al. 2024).

We did not expect participants to use so many different social media platforms regularly and this likely affected drop-off in the survey. Each marketing question was asked for each of the platforms participants used regularly (for alcohol, vape and tobacco products), so it would have become very lengthy for those who used a large number of platforms. As a result later sections of the survey show many instances of missing data.

### Exposure recall and engagement with alcohol marketing on social media

#### Exposure recall of alcohol marketing

Respondents were asked if they had seen any alcohol advertising on the social media platforms they regularly use, and of the *2182* responses, 70.6% ($n = 1541$) reported that they had. These advertisements were seen across many different social media platforms, but most commonly were seen on Instagram (72.9%), YouTube (56.6%), Facebook (45.8%), Tik Tok (37.1%) and Snapchat (19.6%).

#### Engagement with alcohol marketing

Participants were asked if they had engaged with alcohol advertising on any social media (including if they had liked an alcohol brand, shared something related to an alcohol brand, followed an alcohol brand, entered a competition run by an alcohol brand, searched for alcohol brands, used an image filter or effect related to drinking alcohol, or engaged in some other way). Of the 2089 respondents who answered this question, 850 (40.7%) indicated that they had engaged with alcohol ads in some way. The most common type of engagement was liking an alcohol brand on a social media platform (60.3%), sharing something related to an alcohol brand (48%) and following an alcohol brand (37.2%).

#### Relationship between exposure recall of – and engagement with – alcohol marketing

As expected, exposure to and engagement with alcohol advertisements were positively correlated (although not strongly), such that respondents who reported they had seen alcohol advertisements on social media were also more likely to report engaging with alcohol advertisements ($\chi^2$ (1, $N = 2039$) = 222.01, $p < .001$, Cramér's $V = .33$).

#### Differences in exposure recall of alcohol marketing

Differences in exposure to alcohol advertising by age, gender, ethnicity and SES were examined within a binary logistic regression model. This and subsequent regressions were each run twice with different ethnicity reference groups in order to obtain all comparisons of interest. Results for this analysis showed only a difference across age groups such that the odds of seeing alcohol advertising on social media were 1.56 times greater in older than younger respondents ($p<.001$; see Appendix A for full results).

#### Differences in engagement with alcohol marketing

To explore whether engagement with alcohol advertising on social media varied across the four sociodemographic groups a logistic regression analysis was undertaken and results are shown in Table 2. The model was statistically significant $\chi^2$ (8, $N = 1785$) = 137.32, $p < .001$) and age, gender and ethnicity groups made significant contributions. The odds of older respondents (18–20 years) engaging with alcohol advertising on social media were 2.52 times greater than those for younger respondents (14–17 years). The odds of females engaging with alcohol advertising were 1.4 times those for males, and 2.15 times those for other genders. Māori, Pākehā and Pasifika respondents did not differ in their odds of engaging with alcohol advertising, although Māori respondents had 1.76 times, and Pākehā 1.63 times the odds relative to other ethnicities.

Table 2. Binary logistic regression showing differences in engagement with alcohol product advertising on social media by age, gender, ethnicity and socioeconomic status (SES).

| | | 95% CI for odds ratio | | |
|---|---|---|---|---|
| | Odds ratio | Lower | Upper | *p* Value |
| Age[a]: 18–20 years ($n = 818$), 14–17 years ($n = 967$) | | | | <.001 |
| 18–20 vs 14–17 | 2.51 | 2.06 | 3.05 | <.001 |
| Gender: female ($n = 991$), male ($n = 672$), other ($n = 122$) | | | | <.001 |
| Female vs male | 1.40 | 1.14 | 1.73 | .001 |
| Female vs other | 2.15 | 1.42 | 3.27 | .001 |
| Ethnicity[b]: Māori ($n = 409$), Pākehā ($n = 895$), Pasifika ($n = 89$), other ($n = 392$) | | | | <.001 |
| Māori vs Pākehā | 1.09 | 0.85 | 1.40 | .478 |
| Māori vs Pasifika | 1.47 | 0.90 | 2.40 | .119 |
| Māori vs Other | 1.76 | 1.31 | 2.38 | <.001 |
| Pākehā vs Pasifika | 1.35 | 0.84 | 2.13 | .217 |
| Pakeha vs Other | 1.63 | 1.26 | 2.12 | <.001 |
| Pasifika vs Other | 1.21 | 0.74 | 2.00 | .440 |
| Socioeconomic status (SES): low ($n = 395$), middle ($n = 752$), high ($n = 638$) | | | | .490 |
| Low vs middle SES | 1.17 | 0.90 | 1.52 | .233 |
| Low vs high SES | 1.10 | 0.84 | 1.44 | .491 |

*Note:* Model $\chi^2$ (8, $N = 1785$) = 137.32, $p < .001$.
[a]Coding: Engagement with alcohol advertising 1 = yes, 0 = no. For all category contrasts in the predictor variables the left hand category = 1 and the right hand category = 0. This coding favors odds ratios greater than 1 for ease of interpretation.
[b]To obtain all ethnicity contrasts the same model was run several times each with a different reference category for ethnicity. These contrasts are shown in the same table for ease of reporting.

## Alcohol behaviors: purchasing; history, amount and frequency of consumption; hazardous drinking

### Online purchasing

Of the 2201 respondents who responded to this question, 207 (9.4%) reported that they had purchased alcohol online.

### Alcohol history

Of the 2184 respondents who responded whether or not they had ever drunk alcohol, two-thirds (68%; $n = 1498$) indicated that they had drunk alcohol at some point, while 31.4% reported they had never drunk alcohol ($n = 686$).

### Amount and frequency of consumption

Of those who responded regarding the frequency of their alcohol consumption ($N = 1429$), half drank monthly or less (50%; $n = 713$), a third drank two to four times per month (34.2%; $n = 488$), and the remaining 16% drank more than two times per week ($n = 228$). The number of drinks participants reported consuming on a typical drinking occasion ranged from 1–2 (29%; $n = 436$), 3–4 (22%; $n = 327$); 5–6 (22%; $n = 326$), 7–9 (13%; $n = 187$) through to 10 or more (14%; $n = 205$). Participants were also asked how often that had consumed more than six drinks on one occasion during the past year; over a quarter (28.6%; $n = 428$) reported they had never done this, while 35.5% ($n = 530$) reported less than monthly, 20.1% reported monthly ($n = 300$), 11% reported weekly ($n = 164$) and 1% ($n = 15$) reported daily or almost daily.

### Hazardous drinking

AUDIT-C scores ranged from 0 to 12 with a mean of 4.2 (SD = 2.8; $N = 1479$). Higher scores indicate higher rates of hazardous drinking, with 0–4 indicating low risk, 5–7 indicating increasing risk, 8–10 indicating higher risk and 11–12 indicating possible dependence. Among those who completed the AUDIT-C items, 22.1% ($n = 819$) scored at low risk levels, 12.8% ($n = 472$) scored at increasing risk levels, 4.8% ($n = 177$) scored at higher risk levels, and 0.3% ($n = 11$) scored at possible dependence levels.

### Relationships between purchasing alcohol, alcohol history, and hazardous drinking

Purchasing alcohol online was positively related to having a history of alcohol consumption ($\chi^2$ (1, 2137) = 87.78, $p<.001$, $V = .20$), and to AUDIT scores (point biserial r (1448) = .3, $p<.001$). It was also positively related to exposure to alcohol marketing on social media ($\chi^2$ (1, 2319) = 47.40, $p< .001$, $V = .15$) and engagement with this marketing ($\chi^2$ (1,2077) = 192.34, $p < .001$, $V = .31$).

## Differences in alcohol behaviors (purchasing, history, hazardous drinking) by sociodemographic, marketing exposure, and marketing engagement variables

### Correlates of alcohol purchasing

We examined differences in alcohol purchasing by sociodemographic variables, exposure to and engagement with alcohol marketing using a binary logistic regression with age, gender, ethnicity and SES on step 1, and marketing exposure and engagement on step 2. The model was statistically significant ($\chi^2$ (10, $N = 1743$) = 239.68, $p < .001$) and is shown in Table 3. These results indicate that the odds of older respondents purchasing alcohol are 5.56 times greater than those for younger respondents. The odds for Māori respondents purchasing alcohol online are 2.71 times greater than those for other ethnicities, and the odds for Pākehā respondents are 2.19 times greater than those for other ethnicities. The results at Step 2 show that the positive associations of exposure and engagement with purchasing alcohol online remain highly reliable even when sociodemographic variables are statistically controlled, and this relationship is stronger for engagement compared to exposure.

**Table 3.** Binary logistic regression showing differences in purchasing alcohol on line by age, gender, ethnicity and socioeconomic status (SES) (Step 1); and by recall of exposure to and engagement with alcohol advertising (Step 2).

| | | 95% CI for odds ratio | | |
|---|---|---|---|---|
| | Odds ratio | Lower | Upper | *p* Value |
| Step 1 | | | | |
| Age[a] 18–20 years ($n = 801$), 14–17 years ($n = 942$) | | | | |
| 18–20 vs 14–17 | 5.56 | 3.76 | 8.20 | <.001 |
| Gender: female ($n = 976$), male ($n = 651$), other ($n = 116$) | | | | .386 |
| Female vs male | 0.87 | 0.61 | 1.23 | .418 |
| Female vs other | 1.43 | 0.69 | 2.96 | .340 |
| Ethnicity[b]: Māori ($n = 402$), Pākehā ($n = 871$), Pasifika ($n = 86$), other ($n = 384$) | | | | .005 |
| Māori vs Pākehā | 1.24 | 0.85 | 1.82 | .270 |
| Māori vs Pasifika | 1.70 | 0.73 | 3.97 | .222 |
| Māori vs Other | 2.71 | 1.55 | 4.75 | <.001 |
| Pākehā vs Pasifika | 0.73 | 0.32 | 1.67 | .456 |
| Pakeha vs Other | 2.19 | 1.30 | 3.68 | .003 |
| Pasifika vs Other | 1.60 | 0.64 | 4.02 | .318 |
| Socioeconomic status (SES): low ($n = 386$), middle ($n = 737$), high ($n = 620$) | | | | .587 |
| Low vs middle SES | 1.03 | 0.68 | 1.54 | .904 |
| Low vs high SES | 1.23 | 0.79 | 1.92 | .369 |
| Step 2 | 2.55 | 1.38 | 4.69 | .003 |
| Exposure to advertising: yes ($n = 1245$); no ($n = 498$) | | | | |
| Engagement with advertising: yes ($n = 724$); no ($n = 1019$) | 6.49 | 4.12 | 10.31 | <.001 |

*Note:* Model $\chi^2$ (10, $N = 1743$) = 239.68, $p < .001$.
[a]Coding: Purchased alcohol on line 1 = yes, 0 = no. For all category contrasts in the predictor variables the left hand category = 1 and the right hand category = 0. This coding favors odds ratios greater than 1 for ease of interpretation.
[b]To obtain all ethnicity contrasts the same model was run several times each with a different reference category for ethnicity. These contrasts are shown in the same table for ease of reporting.

**Table 4.** Binary logistic regression showing differences in alcohol history by age, gender, ethnicity and socioeconomic status (SES) (Step 1) and recall of exposure to and engagement with alcohol advertising on line (Step 2).

| | | 95% CI for odds ratio | | |
|---|---|---|---|---|
| | Odds ratio | Lower | Upper | *p* Value |
| Step 1[a] | | | | |
| Age: 18–20 years ($n = 786$), 14–17 years ($n = 908$) | | | | |
| 18–20 vs 14–17 | 5.84 | 4.51 | 7.56 | <.001 |
| Gender: female ($n = 946$), male ($n = 634$), other ($n = 114$) | | | | .004 |
| Female vs male | 1.39 | 1.09 | 1.76 | .008 |
| Female vs other | 1.79 | 1.13 | 2.83 | .012 |
| Ethnicity[b]: Māori ($n = 389$), Pākehā ($n = 847$), Pasifika ($n = 83$), other ($n = 375$) | | | | <.001 |
| Māori vs Pākehā | 1.32 | 0.96 | 1.81 | .083 |
| Māori vs Pasifika | 3.34 | 1.94 | 5.78 | <.001 |
| Māori vs Other | 2.95 | 2.09 | 4.17 | <.001 |
| Pākehā vs Pasifika | 2.56 | 1.52 | 4.17 | <.001 |
| Pakeha vs Other | 2.24 | 1.69 | 2.95 | <.001 |
| Pasifika vs Other | 0.88 | 0.52 | 1.50 | .640 |
| Socioeconomic status (SES): low ($n = 374$), middle ($n = 717$), high ($n = 603$) | | | | .249 |
| Low vs middle SE | 1.15 | 0.84 | 1.59 | .377 |
| Low vs high SES | 1.32 | 0.95 | 1.83 | .102 |
| Step 2 | | | | |
| Exposure to advertising: yes ($n = 1220$) vs no ($n = 483$) | 1.79 | 1.38 | 2.33 | <.001 |
| Engagement with advertising: yes ($n = 712$) vs no ($n = 991$) | 6.88 | 4.97 | 9.51 | <.001 |

*Note:* Model $\chi^2$ (10, $N = 1703$) = 541.64, $p < .001$.
[a]Coding: Alcohol history 1 = yes, 0 = no. For all category contrasts in the predictor variables the left hand category = 1 and the right hand category = 0. This coding favors odds ratios greater than 1 for ease of interpretation.
[b]To obtain all ethnicity contrasts the same model was run several times each with a different reference category for ethnicity. These contrasts are shown in the same table for ease of reporting.

### *Correlates of alcohol history (ever drunk alcohol)*

We examined differences in whether participants had ever drunk alcohol by age, gender, ethnicity and SES, and by exposure to and engagement with alcohol advertising using a two-step binary logistic regression. The model was statistically significant ($\chi^2$ (10 $N = 1703$) = 541.64, $p < .001$) and age, gender and ethnicity groups made significant contributions to the model as shown in Table 4. Specifically, the odds of older respondents (18–20 years) ever having drunk alcohol were 5.84 times greater than those for younger respondents (14–17 years). The odds of ever having drunk alcohol were 1.39 times higher in females than males and 1.79 times higher than in other genders. Māori and Pākehā respondents did not differ in their odds of having ever drunk alcohol. Māori respondents had 3.34 and 2.95 times the odds of having ever drunk alcohol than Pasifika or other ethnicity respondents, respectively. Pākehā respondents had 2.56 and 2.24 times the odds of having ever drunk alcohol

**Table 5.** Mean AUDIT-C scores by age, gender, ethnicity & SES groups ($n = 1285$) and by recall of exposure and engagement.

| | N | Mean | SD |
|---|---|---|---|
| Age | | | |
| 14 | 59 | 2.15 | 2.61 |
| 15 | 55 | 2.38 | 3.06 |
| 16 | 205 | 3.36 | 2.60 |
| 17 | 231 | 4.15 | 2.40 |
| 18 | 319 | 4.69 | 2.73 |
| 19 | 228 | 5.05 | 2.70 |
| 20 | 188 | 5.20 | 2.51 |
| Gender | | | |
| Female | 758 | 4.16 | 2.57 |
| Male | 445 | 4.61 | 3.03 |
| Other genders | 82 | 3.90 | 2.81 |
| Ethnicity | | | |
| Māori | 333 | 4.87 | 2.66 |
| Pākehā | 677 | 4.43 | 2.77 |
| Pasifika | 48 | 4.58 | 2.76 |
| Other ethnicities | 227 | 3.04 | 2.52 |
| Socioeconomic status | | | |
| Low | 317 | 4.60 | 2.87 |
| Middle | 544 | 4.08 | 2.69 |
| High | 424 | 4.37 | 2.75 |
| Exposure and engagement | | | |
| Exposed to advertising | 988 | 4.48 | 2.76 |
| Not exposed to advertising | 268 | 3.57 | 2.62 |
| Engaged with advertising | 667 | 5.29 | 2.56 |
| Not engaged with advertising | 542 | 3.16 | 2.55 |

than Pasifika and other ethnicity respondents, respectively. As in the case of purchasing alcohol, the positive associations of exposure to and engagement with alcohol advertising with an alcohol history remain when sociodemographic variables are statistically controlled, and the engagement is more strongly correlated than exposure.

### *Correlates of hazardous drinking*

We examined whether AUDIT scores differed across the sociodemographic groups and by exposure and engagement. Mean and standard deviation AUDIT scores within the different groups are shown in Table 5. To examine whether there were significant differences in AUDIT scores across the groups, two factorial ANOVAs were conducted (to provide statistical control across the variables). The first model, which contained the sociodemographic variables, was statistically significant ($F(13, 1271) = 20.45$, $p < .001$). There were significant differences in AUDIT scores by age ($F = 28.17$, df = 6, $p < .001$), with older respondents have higher scores than younger respondents, and gender ($F = 12.46$, df = 2, $p < .001$), with males having highest scores, followed by females and other genders. There were differences in AUDIT scores by ethnicity ($F = 26.4$, df = 3, $p < .001$) with higher scores in Māori respondents followed by Pākehā, Pasifika and then other ethnicities. Finally, there were differences in AUDIT scores among the SES groups ($F = 4.81$, df = 2, $p = .008$), such that low and high SES groups had higher AUDIT-C scores than the middle SES group. The second model, which contained the first model and the exposure and engagement variables, showed how exposure and engagement were related to hazardous drinking when the sociodemographic variables were statistically controlled. While engagement remained associated with a higher AUDIT score ($F(1,1172) = 168.39$, $p < .001$), exposure became statistically non-significant ($F(1,1172) = 1.01$, $p = .314$).

## Discussion

This study found that among a sample of 14–20 year old young people, almost three-quarters reported seeing alcohol marketing on the social media platforms they use regularly, and well over one-third reported engaging with that marketing. Both exposure to alcohol marketing and engagement with alcohol marketing were correlated with online purchase and alcohol consumption history. The relationships between engagement and alcohol behaviors was stronger than those observed between exposure and consumption. Engagement with alcohol marketing on social media was also positively associated with hazardous drinking patterns. These findings highlight two novel features of social media marketing of alcohol, specifically engagement and online purchase, that are more strongly associated with consumption than simple exposure.

Our findings suggest that algorithmic digital advertising models are more harmful than exposure-based mass media, because the unique feature of social media is the forms of engagement with advertising that it enables – through likes, shares, comments, and so on – and its ability to enable seamless completion of retail purchases. Our findings that people who engaged more with the interactive elements were more likely to purchase alcohol online, have ever drunk alcohol, and have higher levels of hazardous drinking, compared to those who were only exposed, enables us to begin to demonstrate how this advertising model 'tunes into' riskier drinkers. For example, this model might create a 'richer' or 'deeper' engagement with advertising for these drinkers, enlist them in sharing content to their profile or in their networks, and possibly create a loop where the more they engage with alcohol advertisements, the more exposed they are to advertisements. Our findings also demonstrate an association between engagement and online alcohol purchase, and based on the advertising, we might expect that this will also expose them to more alcohol marketing content. As Carah and Brodmerkel (2021) have argued, engagement with digital marketing is multi-faceted. While exposure involves a person viewing an alcohol ad, engagement involves them taking an action that is expressive (a share, comment, or like), produces data (indicates their 'interest' to the algorithmic model), and possibly also results in a purchase (that also produces data).

This study has provided us with a dataset that includes information about young people's self-reported exposure to what they see as alcohol marketing and engagement with it on social media platforms. The platforms would have a much richer, and more insightful, dataset about these relationships, but this information is proprietary; we cannot access or observe it. Rather than using this data for the public good to prevent harm, platforms feed the data into their algorithmic models to further train them to ensure stronger relationships between exposure, engagement and purchase of alcohol. Platforms therefore enable (and profit from) alcohol

marketing that targets young people and other vulnerable groups. They are a key player in the digital marketing supply chain who could be held accountable in any regulation to protect users from alcohol marketing (see Sing and Lyons 2024).

This study also showed that older participants were more likely to report being exposed to alcohol marketing on social media than younger participants (likely reflecting the major life changes across the age span), with no other sociodemographic differences identified. This suggests that exposure is fairly similar across ethnicity, gender and SES groups. This was not replicated for engagement, however, where differences in engagement with alcohol marketing by age, gender and ethnicity were found. Older respondents were more likely to engage with alcohol advertising on social media than younger respondents, females were more likely to engage than males or other genders, and both Māori and Pākehā respondents were more likely to engage compared to other ethnicities. Such differences in engagement with marketing are normally occluded within social media marketing models, and can only be identified *via* self-report of the users. As Phan and Wark (2021) point out in their discussion of social media data, race and racialization 'vanish into algorithmic systems that are beyond our perception'.

The findings also highlight differences in patterns of alcohol consumption, exposure and engagement with alcohol marketing across sociodemographic groups. Over two-thirds of the sample reported that they had ever used alcohol, while the rest had not. Older, female, Pākehā, Māori and lower SES drinkers were more likely to report having ever used alcohol. Of the drinkers, half were drinking more than twice a month and consuming more than five drinks per occasion. Older, male, Pakeha, Māori and Pasifika respondents were the most risky drinkers according to AUDIT scores.

Findings regarding ethnicity are particularly concerning, with young Māori more likely to report having ever consumed alcohol, drinking in more hazardous ways, and engaging more with alcohol marketing on social media than other ethnicity groups. Māori and Pasifika young people are already more likely to be exposed to alcohol marketing in their environments and neighborhoods compared to other groups (Chambers et al. 2018) and live in areas with a higher density of alcohol outlets (Ayuka et al. 2014). The costs of alcohol marketing fall unevenly across ethnicity groups in Aotearoa NZ in ways that deepen inequities between Māori and non-Māori (Marie et al. 2012). For Māori, the multiple harms suffered as a result of colonization are exacerbated by alcohol and its commercial exploitation. This is the first study of its kind to show how new engagement-driven marketing of unhealthy commodities plays out differently for different ethnicity groups in corporate-controlled social media that deploy algorithmic marketing models.

## Limitations

The sample for this study was self-selected and included people who responded to an online survey, many of whom were recruited on social media, regarding social media use and marketing. Therefore, participants may have a particular interest in marketing, perhaps leading them to notice and engage with digital marketing more in social media environments. The results reported here are correlational, therefore we cannot draw any conclusions regarding the causal relationship between exposure to and engagement with alcohol marketing with online purchasing of alcohol or alcohol consumption behaviors. Nevertheless, this is one of the first studies to demonstrate these associations.

We were particularly interested in young people's own perceptions of their social and digital worlds, which meant we used their judgements of what constituted alcohol marketing, in recognition of the dynamism, and mutability that are now inherent to digital alcohol advertising (Goodwin 2022). Likewise we used an SES measure that was not objective but asked participants to rate their own perceptions of how well off their family was. This allows participants to share their views of their perceptions and social position within their own social worlds (Svedberg et al. 2016), although more objective measures may have led to different results. There was a drop-off in responses for the digital marketing survey questions. These were asked for every social media platform that respondents reported using regularly; respondents reported a large number of platforms which may explain the drop-off in responses for this section. It is also worth noting that some questions may be considered more sensitive by some groups, and they may have chosen to not answer specific questions, or to answer in a way that portrayed them more positively (e.g. particular age or gender groups may have chosen not to respond about particular topics). Furthermore, participants aged 14–15 years were recruited *via* schools rather than through digital channels (although they took part online and completed the same questionnaire), so they may have been different in some way to older participants. This would be difficult to establish as age and recruitment procedure are inevitably confounded.

## Conclusions

This exploratory study focused on identifying whether young people see alcohol marketing on social media, if and how they engage with it, how this related to behaviors around alcohol, and whether any of these experiences and behaviors varied across different sociodemographic groups. It employed a descriptive approach, and found that most of the young people in the sample reported seeing alcohol marketing within their digital worlds, some engaged with it, and marketing exposure and engagement were associated with specific alcohol-related behaviors. These initial findings may be highly valuable in informing theories and speculative hypotheses in this newly developing area that could be tested in future confirmatory studies. In Aotearoa NZ there has been a strong resistance to introducing stricter regulations around alcohol marketing, while the New Zealand Ministry of Health has long advocated for low-key, individual-level public education campaigns which have been shown to be relatively ineffective on their own. However, alcohol

marketing is key to drinking cultures and behaviors, and these results suggest that marketing on social media has particular potency for young people's alcohol consumption, as others have argued (Babor et al. 2023). These results strongly suggest that policy and regulation are required in the social media domain in order to reduce inequities and consumption in order to minimize harm to young people.

## Ethical statement

This study was approved by the Human Ethics Committee of Victoria University of Wellington, Aotearoa New Zealand (ref 2993) and met the New Zealand Psychological Society's professional code of ethics. Fully informed consent for the anonymous online survey was obtained via the provision of information on the survey landing page, and consent was evidenced by the completion of the survey form; all responses were anonymous, and datasets kept securely by the research team. Participants were able to receive updates about the findings on the project website.

## Disclosure statement

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## Appendix A

**Table A1.** Binary logistic regression showing differences in exposure to alcohol product advertising on social media by age, gender, ethnicity and socioeconomic status (SES).

| | | 95% CI for odds ratio | | |
|---|---|---|---|---|
| | Odds ratio | Lower | Upper | *p* Value |
| Age 18–20 vs 14–17 | 1.56 | 1.27 | 1.92 | <.001 |
| Gender | | | | .334 |
| Female vs male | 1.17 | .94 | 1.45 | .151 |
| Female vs other | 1.15 | .76 | 1.73 | .506 |
| Ethnicity | | | | .146 |
| Māori vs Pakeha | .88 | .68 | 1.14 | .344 |
| Māori vs Pasifika | .90 | .47 | 1.35 | .399 |
| Māori vs Other | 1.17 | .87 | 1.57 | .310 |
| Pasifika vs Pakeha | 1.11 | .67 | 1.84 | .696 |
| Pasifika vs Other | 1.46 | .86 | 2.48 | .157 |
| Socioeconomic status (SES) | | | | .763 |
| Low vs middle SES | 1.02 | .78 | 1.34 | .893 |
| Low vs high SES | 1.10 | .82 | 1.46 | .527 |

*Notes:* Model chi square (8, $N = 1870$) = 29.40, $p < .001$. Coding: Alcohol advertising exposure 1 = yes, 0 = no. For all category contrasts in the predictor variables the left hand category = 1 and the right hand category = 0. This coding favors odds ratios greater than 1 for ease of interpretation.