

# Perception is reality: qualitative insights into how consumers perceive alcohol warning labels

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## Abstract

**Aims:** This study explores perspectives of on-pack alcohol warning labels, and how they might influence alcohol purchase and/or consumption behavior to inform culturally appropriate label design for effective behavior change.

**Methods:** New Zealand participants  $\geq 18$  years, who reported having purchased and consumed alcoholic beverages in the last month were recruited via a market research panel and grouped into 10 focus groups ( $n=53$ ) by ethnicity (general population, Māori, and Pacific peoples), age group, and level of alcohol consumption. Participants were shown six potential alcohol health warning labels, with design informed by relevant literature, label framework, and stakeholder feedback. Interviews were transcribed and analyzed via qualitative (directed) content analysis.

**Results:** Effective alcohol labels should be prominent, featuring large red and/or black text with a red border, combining text with visuals, and words like "WARNING" in capitals. Labels should contrast with bottle color, be easily understood, and avoid excessive text and confusing imagery. Participants preferred specific health outcomes, such as heart disease and cancer, increasing message urgency and relevance. Anticipated behavior change included reduced drinking and increased awareness of harms, but some may attempt to mitigate warnings by covering or removing labels. Contextual factors, including consistent design and targeted labels for different beverages and populations, are crucial. There was a strong emphasis on collective health impacts, particularly among Māori and Pacific participants.

**Conclusions:** Our findings indicate that implementing alcohol warning labels, combined with comprehensive strategies like retail and social marketing campaigns, could effectively inform and influence the behavior of New Zealand's varied drinkers.

**Keywords:** alcohol; warning labels; alcohol policy; Māori; Pacific; indigenous

## Introduction

Internationally, alcohol is a leading cause of death, disease, and social harm, with alcohol purchase and consumption wide-spread (Ritchie and Roser 2024). Alcohol is considered the most harmful drug in Aotearoa New Zealand (NZ) when considering harms to self, others, and the community (Crossin et al. 2023). This perhaps comes as no surprise, as alcoholic beverages are a Group 1 carcinogen causing cancer (WHO and IARC 2023). The 2022/2023 NZ Health Survey (Health 2023) reported 76% of participants aged  $\geq 15$  years had consumed alcohol in the previous year, of which 21% engaged in hazardous drinking behavior (as measured by the AUDIT-C) (Bush et al. 1998). A higher prevalence of hazardous drinking is seen in men (27%, vs 14% in women),

young adults aged 18–24 years (31%, vs 6%–28% in other age groups), Māori and Pacific peoples (32% and 36%, respectively, vs 21% European/Other, 9% Asian), and those living in the most deprived areas of NZ (27%, vs 18% in the least deprived area) (Health 2023).

The NZ government has implemented several policies to reduce the supply and demand of alcohol (e.g. restrictions on alcohol advertising) and alcohol-related harm (e.g. strong drink-driving rules). However, the World Health Organization (WHO) recommends the use of warning labels as one of a few policy interventions to raise awareness of the health effects from alcohol consumption, and thus drive a change in behavior (Organization 2022). To date, only 55 countries have policies that mandate alcohol warning labels (AWL)

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(International Alliance for Responsible Drinking 2021). NZ and Australia have a pregnancy warning label for alcoholic beverages, which became mandatory in June 2023—a process that was not without challenges (Heenan *et al.* 2023). However, there is limited evidence base for AWLs, with many studies having design limitations (e.g. small sample size, use of quasi-randomization) and/or a focus on select populations (e.g. women only, university students only, a restricted age group), limiting generalizability to other populations (Hassan and Shiu 2018; Kokole *et al.* 2021; Hassan, Parry, and Shiu, 2022; Peddireddy *et al.* 2022; Davies *et al.* 2023). There is also a dominant use of quantitative research (Zahra *et al.* 2015; e.g. Winstock *et al.* 2020), which may fail to capture a more nuanced understanding of labels.

Following Vallance *et al.*'s (2018) qualitative approach in Canada, we extend this body of research by focusing on NZ, a country with a binge-drinking culture and multi-ethnic diversity, while also having legislated obligations to NZ's indigenous Māori. Vallance *et al.* (2018) conducted focus groups to refine the content and design of Hobin *et al.*'s (2017) enhanced alcohol labels. Key themes from the study included the importance of these labels, consumers' right to health risk awareness, and the need for accessibility. Additionally, they highlighted the labels' potential to spark crucial conversations about alcohol and emphasized the importance of educating consumers on interpreting and using them in their drinking habits. Moreover, of concern is that in the limited NZ research on AWLs, few Māori or Pacific participants have been included, and cultural context has not been considered (Food Standards Australia New Zealand 2019; Morgan 2019). Drawing from prior label research, Purmehdi *et al.* (2017) categorized 13 label characteristics and, through their meta-analysis, found that by adjusting these design elements, a label becomes more prominent—such as increasing font size or using distinctive shapes—resulting in heightened consumer attention, improved comprehension, and better recall. However, previous research has not examined all dimensions of alcohol label design, which include: (i) attention, (ii) comprehension, (iii) recall, (iv) judgment, (v) behavior, (vi) content, (vii) text salience, (viii) shape salience, (ix) picture and (x) location, (xi) promotional preactivation, (xii) frequency of exposure, and (xiii) social influence (Purmehdi *et al.* 2017). Previous studies have focused on individual dimensions, such as attention (Pham *et al.* 2018), judgment, and behavior (Hassan and Shiu 2018). Exploring the perception of all warning label dimensions allows a more nuanced understanding of preferences and effect.

A qualitative study was designed to answer the research question: How do individuals in NZ interpret and respond to various AWLs?. We utilized Purmehdi's (2017) 13 dimensions of label design to create 6 AWLs and analyse qualitative data from participants.

## Methods

A qualitative study design was utilized, with 10 focus groups ( $n = 53$ ) undertaken in May 2022 (Appendix D). Focus groups allow for a range of understandings and enable discussions of shared ideas, highlighting similarities and differences of understandings (Liamputtong 2011). Ethics approval was received from the University of (deleted for anonymity) Human Participants Ethics Committee (UAHPEC).

## Sample and recruitment

Participants were recruited from throughout NZ, via a reputable, international market research company (Dynata). Participants were eligible to take part if they were aged  $\geq 18$  years, were comfortable reading and speaking English, lived in NZ, had access to a working phone and/or computer with video capability, and reported having purchased and consumed alcoholic beverages from an off-license retail outlet (including supermarkets) in the last month. We utilized quotas for gender and ethnicity to ensure the sample had a broad representation of consumer groups, particularly those groups that are disproportionately affected by alcohol. Participants who identified as Māori and/or Pacific were offered the option of attending a mixed ethnicity, Māori-only, or Pacific-only focus group. Participants in mixed ethnicity focus groups were grouped according to level of alcohol use (based on their AUDIT-C scores) (Bush *et al.* 1998). There were two Māori-only focus groups (17%) and two Pacific-only focus groups (15%). In the NZ population, Māori make up 16.5% of the population and Pasifika 8.1% (Stats 2020).

## Data collection

The focus groups were held online using the 'Zoom' video platform. To ensure appropriate cultural processes were followed, Māori-only focus groups were led by a Māori facilitator, while Pacific-only focus groups were conducted by a Pacific facilitator. Focus groups ran for  $\sim 90$  min. The facilitator used a semi-structured moderator guide with a series of open-ended questions and the display of six visual alcohol labels (Appendix A). The focus groups allowed a lively discussion to occur as interaction among participants was able to stimulate dialog, leading to the generation of new ideas and perspectives that might not arise in individual interviews. Many people 'bounced' off each other and, in some instance, provided a counter view. We asked participants questions about the harms of alcohol, whether you had seen the pregnancy warning label, and what you thought of six different AWLs (see Appendix A).

Participants were provided with payment for their time. Mixed ethnicity focus groups received a \$120 supermarket voucher; Māori-only and Pacific-only focus group members arranged their preferred form of the \$120 incentive via their group facilitator. As a duty of care, all participants were emailed after the focus groups a copy of the NZ Health Promotion Agency 'drinking check' booklet.

## Label design

The chosen warning labels were designed to explore different possibilities in terms of layout and content focus (Fig. 1). A number of resources were utilized when designing the labels: (i) the expertise of the cross-disciplinary research team, who have experience in public health, alcohol, Māori and Pacific health, and marketing; (ii) the 13 dimensions of warning labels proposed by Purmehdi *et al.* (2017); (iii) previous AWL research (e.g. use of) (Hassan and Shiu 2018; Kokole *et al.* 2021; Joyce *et al.* 2023); and (iv) discussions with seven NZ stakeholders (see acknowledgments). As a result, the design process was iterative, and all labels were co-designed, assisted by a graphic designer. To increase the realism/relevance to participants, the tested warning labels were displayed on an image of a non-branded brown beer bottle (Appendix B), which included the mandatory 'standard drinks' label and

Heart attack or stroke label	Mental health label <sup>1</sup>	Cancer label <sup>2</sup>
		
Car crash label <sup>3</sup>	Domestic violence label	Liver cancer label
		

**Figure 1** Tested warning labels. <sup>1</sup> ‘Kia Tupato’ can be translated as ‘Be cautious’; <sup>2</sup> ‘Kia mataara’ can be translated as ‘Be alert’; <sup>3</sup> In NZ, white crosses are often placed on the side of roads, near where car fatalities have occurred

the voluntary (but soon to be mandatory) pregnancy warning label (Food Standards Australia New Zealand 2024). Beer was chosen as it was the leading alcoholic beverage available in NZ in 2022 (Stats NZ, 2023). Upper and lower case text was kept the same size across all labels and was consistent with the minimum size requirements for the type and pictogram used for the NZ pregnancy warning label (Food Standards Australia New Zealand 2024).

## Analyses

Focus groups were audio-recorded and transcribed by a professional transcription service. Directed content analysis with use of deductive codes (Hsieh and Shannon 2005). Deductive codes were developed on the basis of the interview guide and Purmehdi’s (2017) framework to identify those elements of the label that were perceived as most effective (Appendix C). To capture cultural insights, Māori-only focus groups were analysed by a Māori researcher, while Pacific-only focus groups were analysed by a Pacific researcher. This process also ensured culturally significant aspects were not overlooked by the a priori codes. Any observed differences in responses between the three ethnic groups are additionally reported. Each coder (three of the authors) highlighted passages that related to each of the 13 label dimensions and then coded using predetermined codes within each of these dimensions. As a worked example, any text related to “Text” was highlighted to relate to “Text salience” which then was further coded into text direction, the amount of text, font size, use of white space, font type, color, and size. If interview text did not fit into the initial coding scheme, it would have been assigned a new code; however, in our case, all our interview text “fit” into the predetermined codes. Each coder was given the codebook based on the 13 label dimensions, then they discussed their findings to ensure any inconsistencies or issues could be addressed (none occurred), and then lastly, they

contributed to the write-up of the findings. Please note, we found no text related to “recall.”

## Results

### Attention

To be effective, a warning label must first be noticed, and to be noticed, the label must be conspicuous (Purmehdi et al. 2017). Participants identified that the position of the label on the bottle, plus the overall size, color, font size, and use of an image or pictogram on the label attracted their attention. ‘And with the colours as well, like with the heart shape and the line, you really want to look at it – oh, what does it say?’ Female #35 (26–50 years, mild/moderate alcohol use, heart attack/stroke label).

### Comprehension

Participants discussed how important it was for the label to be understood. While all recognized the content advertised (e.g. cancer, heart attack, or stroke, etc.), some labels were harder to understand, and participants preferred the use of fewer words on the labels. Furthermore, making the message as “punchy” and clear as possible was particularly important to participants, considering the time-pressured environment in which alcohol is purchased (e.g. in supermarkets) and lower literacy levels in some subgroups of the population (Tertiary Sector Performance Analysis and Reporting, Ministry of Education 2008). ‘People normally don’t have too much patience when they buy the alcohol. They just grab and drink.’ Female #30 (18–25 years, mild/moderate alcohol use, car crash label).

The car crash label confused some participants due to the wording of the text, highlighting the importance of message understanding. While participants were enthusiastic about the use of Te Reo Māori in two of the labels, they wanted the English translation included.

## Judgment

Judgment relates to whether people perceive there is a real risk, whether there is urgency around the health risks, and the truthfulness and believability of the warning (Purmehdi *et al.* 2017). Participants perceived most issues raised as having a high perceived likelihood of harm and health risk. The only label that had some discussion around this topic was the mental health label, which appealed more to young adults, while some older individuals believed it was ‘jumping on the bandwagon’ and was not specific enough. ‘I have friends in my age group that are affected by drinking too much alcohol and are causing them mental health issues. It’s the most impactful for me... It could be just the age I’m in, but it’s actually something that’s relevant to my age group at the moment.’ Male #24 (18–25 years, heavy alcohol use).

Participants discussed the need for labels to be relevant for the target audience, suggesting specific labels should be directed to specific consumer groups. For example, ready-to-drink (RTD) alcoholic beverages target younger adults, so RTD warning labels should be tailored to younger adults. Alternatively, older consumers may be more concerned about having a heart attack or stroke, while young consumers may be more concerned about mental health or cancer. This consideration is also important to ensure health messages reach groups who are disproportionately impacted by alcohol-related harm. For example, appropriate use of non-English languages and culturally relevant symbols to convey messages to key populations.

The significance of emphasizing a particular health outcome instead of a broader concept was discussed. Participants deemed this approach as more pertinent, accurate, and urgent, particularly when focusing on specific types of cancers, for instance.

All labels were perceived as truthful and believable. However, there was some discussion around how the use of statistics in two labels made their message more truthful and thus more impactful. Some participants still wanted clarification about whether the statistics were related to NZ or were international. In this case, the provision of data triggered reflection and thus consideration of the claim.

## Behavior

Behavior relates to whether the viewer of the label wants to, or does, change their behavior after seeing the warning label (Purmehdi *et al.* 2017). Participants believed the labels presented would help inform some people and lead to behavior change, but only if the label was relevant to them as discussed previously.

Many participants (irrespective of level of alcohol use) viewed their own use of alcohol as “normal,” and did not believe they were at risk for any of the health conditions in the labels. The labels were perceived to be directed at others—particularly people with heavy alcohol use or older people. This is an important distinction as it demonstrates warning labels need to communicate relevance because participants often interpreted the risks of alcohol and the use of warning labels as applying to a third person (i.e. not them).

Māori and Pacific people have a strong family-focused, collective worldview. In keeping with this, Māori and Pacific-only focus group participants emphasized that AWLs should consider behavior change from the perspective of family instead of the individual. ‘... for me it might be a picture of a family, so if I see a family I might, ooh, my choices, but I don’t know

how you would make a picture of your fam so you would look at it and go oh gosh. Maybe, change my mind.’ Male #51 (Pacific-only group, heavy alcohol use, mixed age).

## Content

Participants had similar views on the use of signal words to draw attention to a warning, preferring the use of the word “WARNING,” because “CAUTION” may not be urgent enough. ‘I think the wording is not strong enough...’. Female #8 ( $\geq 51$  years, mild/moderate alcohol use, heart attack/stroke label).

A number of participants discussed the importance of phrasing, including the use of the word “can” when discussing alcohol’s impact on health. They pointed out that since everyone reacts differently to alcohol, there was no guarantee one would be afflicted with associated diseases, illnesses, or social issues. ‘Would it not be better if it just said alcohol harms your mental health, rather than having the “can” in there? I mean, “can” is you might be lucky, you might not be.’ Male #12 ( $\geq 51$  years, mild/moderate alcohol use).

The need for a warning label to focus more on the harms of high alcohol intake was raised. Some participants wanted to quantify how much they could drink before harm was caused (e.g. how many standard drinks). Such reflection is especially interesting given that many participants did not see their own behavior as problematic.

Others wanted to state that “excessive alcohol” use is what causes the harm, not “any” alcohol use—a position often taken by heavy users of alcohol. This point relates to the idea that participants perceived that not “everyone” needed to decrease their alcohol consumption (discussed further in emergent themes below).

## Text salience

Text salience relates to text direction, the amount of text, font size, use of white space, font type, color and size, etc. (Purmehdi *et al.* 2017). For example, words in capitals can be harder to read than sentences, while a clear and large font is particularly important for people who are visually impaired. Focus group participants wanted the “attention” word to be in capitals, e.g. “WARNING” as opposed to “warning.”

In general, the font size of text used in the labels was seen as appropriate (the exception was the car-crash label, for which some participants felt the text was too small), and labels with minimal text were thought to be more effective. Labels were perceived as needing to be “short and to the point.”

The color of the label and text was seen as key to capturing attention, with participants cognisant of the need for the label to “stand out” (e.g. differentiate from branding and color). Having a white background and borders around a warning label was seen as effective at highlighting the message more. ‘It still stands out because it’s on a white background on the bottle...’. Female #6 (26–50 years, heavy alcohol use, partner violence label).

In terms of color, red labels implied a different level of risk to some people than yellow labels. People in the mixed ethnicity focus groups preferred the use of red in labels, whereas yellow was preferred by participants in the Māori and Pacific-only focus groups. Participants also favored color combinations (e.g. black and white), as they improved legibility, although this finding may have been influenced by the darker color of the bottle on which the labels were placed.

### Shape salience

The shape of the warning label was important for some, with participants suggesting that the label shape needs to be different from other branding on the bottle. ‘Keep it more rectangular so it’s different from the beer labelling itself. . . . Make it stand out, like it’s clearly been added as an additional item not from the beer manufacturer’. Male #11 ( $\geq 51$  years, mild/moderate alcohol use).

### Images

Images and pictograms were considered effective at drawing attention to the label and conveying risk. One participant mentioned, ‘. . . any label that has got a picture on, you are going to take more notice of. . . .’ Male #45 (Pacific-only group, mild/moderate alcohol use, mixed age).

Pictograms were well received—the one that had the most impact on participants of the mixed ethnicity groups was the heart attack/stroke pictogram. In contrast, the white cross in the road accident label had the most impact for members of the Māori and Pacific-only focus groups, with participants often personally affected by alcohol-related road accidents.

The ease with which each pictograms meaning could be interpreted, varied. For example, the heart pictogram was very clear. However, the white cross pictogram used in the car crash label confused some participants in the mixed ethnicity groups, who often related it to religion rather than death. ‘I’m a bit confused. . . . it’s not just one religion that drinks. It’s everyone.’ Male #29 (18–25 years, mild/moderate alcohol use). To address this confusion, one participant suggested using a headstone, or a cross on the headstone, as the image instead, while another suggested using a car-crash pictogram.

The use of images in the liver cancer label and the domestic violence label received mixed responses, and were often discussed in relation to the mandatory graphic warning labels used on all tobacco products in NZ (Ministry of Health 2023). Some participants noted that alcohol-related violence was difficult to capture in a picture, as violence may be verbal or emotional (i.e. not just physical), and could also be directed at pets/animals. In addition, participants felt strongly that any images used for the domestic violence label should not alienate/single out groups, or reinforce stereotypes. For example, some participants felt the domestic violence label should not be gendered. One novel suggestion was to utilize holographic labels, which change when viewed from different angles.

### Location

Warnings placed on the front of the bottle were thought to be more effective, as well as suggestions for more innovative placements, such as on the neck of the bottle, inside or on the cap, or on any glassware the product was presented in at a bar/restaurant.

### Promotional preactivation

Similar to commercial marketing techniques, participants discussed the need for consistent messaging (i.e. in content and design) to maximize the impact across all locations where alcohol is promoted. Suggestions included ensuring warning labels and/or similar messaging to the labels are also placed on the outer packaging of alcoholic beverages (including on related in-store signage), in food outlets (e.g. on restaurant alcohol menus), and in social marketing campaigns (e.g. online or offline advertising).

### Frequency of exposure

Despite seeing the need for some consistency in warning labels, some participants suggested having a rotating set of labels, not only to appeal to different consumer groups, but to reduce the chance of boredom or message fatigue. Again, this approach would mirror commercial marketing practices, where advertising is slightly edited to delay “message wear-out,” ‘need to change it regularly because otherwise people just won’t notice it after a while and the message will get lost.’ Female #? (50+ heavy drinkers).

### Social influence

Participants discussed the social drinking situations where the label could be a talking point. However, avoidance behaviors related to AWLs were also discussed by participants, such as turning the bottle around to avoid seeing the label, removing the label, or covering up the label.

### Discussion

This qualitative study on AWLs gathered views from NZers, particularly those disproportionately affected by alcohol. It offers valuable insights for future label development. Findings highlighted the importance of addressing the 13 health warning label dimensions suggested by Purmehdi et al. (2017). An effective AWL would be large, on the bottle front, with red and/or black text, a red border, combining text with visuals, and using activating words like “WARNING” in capitals. A key requirement for effective labels is to contrast with the color of the vessel. Labels must also be easy to understand and avoid excessive text and confusing pictograms or pictures. Participants preferred specific (i.e. concrete information) as opposed to more abstract information, such as specific health outcomes like heart disease and cancer, which increased message urgency and relevance. Behavior change was anticipated with increased social awareness and discussion of harms amongst friends and family. However, consumers may try to mediate the warnings through covering the label, ripping the label off, or trying to buy an unlabeled alcohol product. Moreover, participants often believed they were unlikely to be harmed by alcohol and that AWLs were aimed at other groups of consumers, suggesting an “othering” effect. The importance of context was also apparent; this included consistent content and design across warning labels and alcohol marketing/promotion, rotating warning labels or up-dating them to delay any “wear-out,” and the need for targeted warning labels across different types of alcoholic beverages and target populations. Findings did not differ greatly between focus groups, although participants in the Māori and Pacific-only groups had a strong focus on the impact of alcohol on the health and wellbeing of the collective (e.g. family and friends), which influenced their views on label design and impact. Below we discuss the implications of our findings, which are novel (see [Supplementary Material 1](#), for an overview of our findings in line with previous research).

Policy makers should consider how to target and segment alcohol labeling dependent on socio-demographic characteristics. Our research suggests tailored and targeted messaging would work best. For example, the heart attack/stroke pictogram had a significant impact on participants from mixed ethnicity groups, while the white cross in the road accident label resonated more with Māori and Pacific-only focus groups. Previous research has found that health messages

matched to gender and type of drink (e.g. wine, beer, and vodka) are more relevant and acceptable (Thomson et al. 2012).

Research and policy makers should consider further attention-grabbing strategies. Our findings suggest innovative AWL placements such as frontal bottle placement, bottle neck, on the cap, or even glassware in bars. They may also wish to consider the use of holograms to catch attention and the shape of the AWL, which our findings suggest needs to be different from other branding on the bottle. The word use of wording is also important, with words such as “WARNING” preferred over “CAUTION” for urgency, especially when presented in capital letters. Furthermore, cultural differences need to be considered for the interpretation of colors, icons, and highlighted issues. Due to inconsistent findings, we need further research on preferred concrete versus abstract labeling in order to provide specific recommendations to policy makers.

Further investigation is needed about the knowledge of alcohol harm. Our findings suggest many do not consider themselves to be at risk of alcohol. We found that participants wanted to quantify the number of “harmful” standard drinks (SD); in fact, in 2023, the WHO released a statement that no amount of alcohol is safe (WHO 2023). Moreover, past research suggests that a significant proportion of people have a poor understanding of standard drinks (e.g. Carruthers and Binns 1992; Rundle-Thiele et al. 2008; Sharp et al. 2014) and find it harder to pour a higher-strength SD (Wettlaufer 2018). More updated research is needed to further our understanding of current knowledge, which could inform future education campaigns (e.g. identify common misconceptions).

Extending future research on distancing behaviors would also inform education campaigns. We found that drinkers often use “othering” to distance themselves from “heavy drinkers” and “alcoholics,” in line with the findings of Davies et al. (2023). Our finding that participants preferred “softening words” when highlighting alcohol harms (i.e. “can cause” vs “causes”), likely to justify their (own) continued consumption of alcohol, was also observed in the above Australian research, where use of phrases, such as “increases risk” in AWLs, was considered more convincing and believable for women than “can cause” (Pettigrew et al. 2014). This third-person effect showcases how individuals tend to believe that messages as well as norms primarily influence others, while they themselves remain unaffected (Atkinson et al. 2013) as well as distancing themselves from “problem” drinkers (Conroy et al. 2022, Morris et al. 2022). Consequently, drinkers may downplay the risks of excessive alcohol consumption and rationalize their own behavior by attributing negative consequences to others, reinforcing the psychological barrier between themselves and stigmatized groups. Policy makers and social markers may wish to consider education campaigns about discussing and showcasing that there is no “safe” level of alcoholic consumption. In this vein, the role of AWLs is to remind and normalize the negative effects of alcohol. Other distancing behaviors, such as turning the bottle around, removing, or covering up the label, also need further research attention.

Participants suggested having a range of different AWLs in circulation that are regularly revised. This finding mirrors international (Hammond 2011) and NZ (Ministry of Health 2023) tobacco on-pack warning labels, and commercial marketing communications practices where advertisements are

varied over time to reduce advertising “wear-out” (Hitchman et al. 2014). Policy makers should consider whether rotating labels can be implemented. Similarly, research on tobacco (Kim et al. 2014) and sugar-sweetened beverages (Gupta et al. 2021) has shown the effectiveness of extrapolating on-pack health messaging to outer product packaging and point-of-sale advertising, but there has been no NZ specific research. Thomson et al. (2012) also found that warning labels should be integrated with social marketing campaigns, and labels should be segmented (consumer and beverage). We encourage policy makers to work with health promotion and social marketing professionals to present an integrated approach.

Further research is needed into the location, frequency of exposure, and social influence of AWLs, as well as their comprehension. Our findings present novel suggestions for placements of AWLs on bottle caps and necks. Participants also suggested positive and negative social influences and behaviors, such as peeling of the AWL, holding bottles to specifically cover the AWL, or conversing about the AWL at social gatherings (e.g. BBQ). Further research is also needed on the comprehension of multilingual labels and cultural differences and interpretations of icons and imagery. Our findings highlight the unique value a cultural lens can offer, raising the voices of those who may be underrepresented in academic research.

Limitations of the study include a small sample size of the focus groups and that they were undertaken online. While this online mode did provide the opportunity to meet with participants from across NZ, as with all online focus groups, there could have been some minor technical difficulties that may have disrupted rapport and the flow of conversation. Moreover, as is common in focus groups, not all participants may have been able to have their voices heard due to dominant conversations. However, there were no obvious indications that technical difficulties occurred or that personalities dominated the conversation as the facilitators made affords to ensure all participants had a say.

## Conclusion

To conclude, this study demonstrates the usefulness of Purmehdi’s et al.’s (2017) 13 elements of label design when developing AWLs and that missing aspects of one dimension mean the label may lack the potential for behavior change. This study also highlights the importance of considering consumers, including perspectives from Indigenous populations, various and nuanced interpretations of warning labels, and their impact not just on individuals but also on the collective. Our results suggest that the introduction of warning labels on alcohol alongside a multi-faceted approach, including retail and social marketing campaigns, may be an effective way to better inform and change the behavior of NZ’s diverse drinkers.

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## 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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## Supplementary data

Supplementary data is available at *Alcohol and Alcoholism Journal* online.

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## Data availability

The data cannot be publicly shared.

## References

- Atkinson AM, Bellis M, Sumnall H. Young peoples' perspective on the portrayal of alcohol and drinking on television: findings of a focus group study. *Addict Res Theory* 2013;21:91–9. Taylor & Francis. <https://doi.org/10.3109/16066359.2012.687795>.
- Bush K, Kivlahan DR, McDonnell MB. *et al.* The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. *Arch Intern Med* 1998;158:1789–95. American Medical Association. <https://doi.org/10.1001/archinte.158.16.1789>.
- Carruthers SJ, Binns CW. The standard drink and alcohol consumption. *Drug Alcohol Rev* 1992;11:363–70. <https://doi.org/10.1080/09595239200185491>.
- Conroy D, Griffin C, Morton C. Defending, contesting and rejecting formal drinker categories: how UK university students identify as 'light-drinkers' or 'non-drinkers'. *Drugs Educ Prev Policy* 2022;29:509–18. Taylor & Francis. <https://doi.org/10.1080/09687637.2021.1929078>.
- Crossin R, Cleland L, Wilkins C. *et al.* The New Zealand drug harms ranking study: a multi-criteria decision analysis. *J Psychopharmacol* 2023;37:891–903.
- Davies EL, Cooke R, De Visser RO. *et al.* Calling time on responsible drinking: a qualitative study of perceptions of information on alcohol product labels. *Br J Health Psychol* 2023;28:320–37. <https://doi.org/10.1111/bjhp.12627>.
- Food Standards Australia New Zealand. *Pregnancy Warning Labels on Packaged Alcohol: A Review of Recent Literature*. Food Standards Australia New Zealand, 2019. <https://www.foodstandards.gov.au/sites/default/files/food-standards-code/proposals/Documents/SD1%20PWL%20Literature%20Review.docx&ved=2ahUKewjO8rma-uuHAXVazDgGHQ8TBJ4QFnoECBIQAQ&cusg=AOvVaw2g5bngK-fARV9IXo1qjCfd>.
- Food Standards Australia New Zealand. Pregnancy warning labels – design elements and downloadable labels. 2024. <https://www.foodstandards.gov.au/business/labelling/pregnancy-warning-labels/pregnancy-warning-labels-downloadable-files> (15 January 2024, date last accessed).
- Gupta A, Billich N, George NA. *et al.* The effect of front-of-package labels or point-of-sale signage on consumer knowledge, attitudes and behavior regarding sugar-sweetened beverages: a systematic review. *Nutr Rev* 2021;79:1165–81. Oxford University Press. <https://doi.org/10.1093/nutrit/nuaa107>.
- Hammond D. Health warning messages on tobacco products: a review. *Tob Control* 2011;20:327–37. BMJ Publishing Group Ltd.
- Hassan LM, Shiu E. A systematic review of the efficacy of alcohol warning labels: insights from qualitative and quantitative research in the new millennium. *J Soc Mark* 2018;8:333–52. Emerald Publishing Limited. <https://doi.org/10.1108/JSOCM-03-2017-0020>.
- Hassan LM, Parry S, Shiu E. Exploring responses to differing message content of pictorial alcohol warning labels. *Int J Consum Stud* 2022;46:2200–19. Wiley Online Library. <https://doi.org/10.1111/ijcs.12779>.
- Ministry of Health New Zealand. New Zealand Health Survey: Annual Update of Key Findings 2022/23. In: *Annual Update of Key Results*. New Zealand: Ministry of Health Wellington, 2023. <https://www.health.govt.nz/publication/annual-update-key-results-2022-23-new-zealand-health-survey>.
- Heenan M, Shanthosh J, Cullerton K. *et al.* Influencing and implementing mandatory alcohol pregnancy warning labels in Australia and New Zealand. *Health Promot Int* 2023;38:daac022. Oxford University Press. <https://doi.org/10.1093/heapro/daac022>.
- Hitchman SC, Driezen P, Logel C. *et al.* Changes in effectiveness of cigarette health warnings over time in Canada and the United States, 2002–2011. *Nicotine Tob Res* 2014;16:536–43. Oxford University Press UK. <https://doi.org/10.1093/ntr/ntt196>.
- Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res* 2005;15:1277–88. Sage Publications Sage CA: Thousand Oaks, CA. <https://doi.org/10.1177/1049732305276687>.
- International Alliance for Responsible Drinking. Health Warning Requirements. 2021. <https://iardwebprod.azurewebsites.net/science-resources/detail/Health-Warning-Labeling-Requirements> (15 January 2024, date last accessed).
- Joyce KM, Davidson M, Manly E. *et al.* A systematic review on the impact of alcohol warning labels. *J Addict Dis* 2023;42:170–93.
- Kim AE, Nonnemaker JM, Loomis BR. *et al.* Influence of point-of-sale tobacco displays and graphic health warning signs on adults: evidence from a virtual store experimental study. *Am J Public Health* 2014;104:888–95. American Public Health Association. <https://doi.org/10.2105/AJPH.2013.301723>.
- Kokole D, Anderson P, Jané-Llopis E. Nature and potential impact of alcohol health warning labels: a scoping review. *Nutrients* 2021;13:3065. MDPI. <https://doi.org/10.3390/nu13093065>.
- Liamputtong P. Focus Group Methodology: Principle and Practice/Liamputtong. *Focus Group Methodol*. Prancee-London: Sage, 2011, 224.

- Ministry of Health. *Tobacco Packing Warnings*. Ministry of Health NZ, 2023. <https://www.health.govt.nz/our-work/preventative-health-wellness/smokefree-2025/smokefree-and-vaping-history/smokefree-background-information>, (2 March 2024, last date accessed).
- Morgan R. *Alcohol warning label survey report*. Commissioned by Food Standards Australia New Zealand, 2019. <https://www.foodstandards.gov.au/sites/default/files/food-standards-code/proposals/Documents/SD2%20Roy%20Morgan%20Alcohol%20Labelling%20Survey%20Report%20-%20Approval.pdf>.
- Morris J, Moss A, Albery IP. *et al.* The “alcoholic other”: harmful drinkers resist problem recognition to manage identity threat. *Addict Behav* 2022;**124**:107093Elsevier. <https://doi.org/10.1016/j.addbeh.2021.107093>.
- World Helath Organization. Health warning labels on alcoholic beverages: opportunities for informed and healthier choices. *Brief 4, Geneva* 2022. <https://www.who.int/publications/i/item/9789240044449>.
- Peddireddy S, Boniface S, Critchlow N. *et al.* Factors associated with adolescents’ support for product information and health messaging on alcohol packaging: a cross-sectional study in the United Kingdom. *Alcohol Alcohol* 2022;**57**:364–71. Oxford University Press. <https://doi.org/10.1093/alcal/agab080>.
- Pettigrew S, Jongenelis M, Chikritzhz T. *et al.* Developing cancer warning statements for alcoholic beverages. *BMC Public Health* 2014;**14**: 1–10. BioMed Central. <https://doi.org/10.1186/1471-2458-14-786>.
- Pham C, Rundle-Thiele S, Parkinson J. *et al.* Alcohol warning label awareness and attention: a multi-method study. *Alcohol Alcohol* 2018;**53**:39–45. Oxford University Press. <https://doi.org/10.1093/alcal/agx087>.
- Purmehdi M, Legoux R, Carrillat F. *et al.* The effectiveness of warning labels for consumers: a meta-analytic investigation into their underlying process and contingencies. *J Public Policy Mark* 2017;**36**: 36–53. SAGE Publications Sage CA: Los Angeles, CA. <https://doi.org/10.1509/jppm.14.047>.
- Ritchie H, Roser M. Alcohol Consumption. *Our World Data*, 2024. <https://ourworldindata.org/alcohol-consumption>.
- Rundle-Thiele S, Ball K, Gillespie M. Raising the bar: from corporate social responsibility to corporate social performance. *J Consum Mark* 2008;**25**:245–53. Emerald Group Publishing Limited.
- Sharp C, Marcinkiewicz A, Rutherford L. Attitudes towards Alcohol in Scotland: Results from the 2013 Scottish Social Attitudes Survey. In: *NHS Health Scotland Edinburgh*, 2014.
- Stats NZ. Ethnic group summaries reveal New Zealand’s multicultural make-up. 2020. <https://www.stats.govt.nz/news/ethnic-group-summaries-reveal-new-zealands-multicultural-make-up/> (10 May 2024, date last accessed).
- Stats NZ. Alcohol available for consumption: Year ended December 2022. 2023. <https://www.stats.govt.nz/information-releases/alcohol-1-available-for-consumption-year-ended-december-2022> (15 January 2024, date last accessed).
- Tertiary Sector Performance Analysis and Reporting, Ministry of Education. *Literacy and Numeracy in New Zealand: Findings from the Adult Literacy and Life Skills Survey*. Ministry of Education, 2008. <https://www.educationcounts.govt.nz/publications/series/ALL/7>.
- Thomson LM, Vandenberg B, Fitzgerald JL. An exploratory study of drinkers views of health information and warning labels on alcohol containers. *Drug Alcohol Rev* 2012;**31**:240–7. Wiley Online Library.
- Vallance K, Romanovska I, Stockwell T. *et al.* “We have a right to know”: exploring consumer opinions on content, design and acceptability of enhanced alcohol labels. *Alcohol Alcohol* 2018;**53**:20–5. Oxford University Press. <https://doi.org/10.1093/alcal/agx068>.
- Wettlaufer A. Can a label help me drink in moderation? A review of the evidence on standard drink labelling. *Subst Use Misuse* 2018;**53**: 585–95. <https://doi.org/10.1080/10826084.2017.1349798>.
- WHO. No level of alcohol consumption is safe for our health. 2023. <https://www.who.int/europe/news/item/04-01-2023-no-level-of-alcohol-consumption-is-safe-for-our-health> (10 May 2024, date last accessed).
- WHO, IARC. Joint statement by WHO/Europe and IARC to the European Parliament – raising awareness of the link between alcohol and cancer. 2023. <https://www.who.int/europe/news/item/06-11-2023-joint-statement-by-who-europe-and-iarc-to-the-european-parliament-raising-awareness-of-the-link-between-alcohol-and-cancer> (9 May 2024, date last accessed).
- Winstock AR, Holmes J, Ferris JA. *et al.* Perceptions of alcohol health warning labels in a large international cross-sectional survey of people who drink alcohol. *Alcohol Alcohol* 2020;**55**:315–22. Oxford University Press. <https://doi.org/10.1093/alcal/agz099>.
- Zahra D, Monk RL, Corder E. ‘If you drink alcohol, then you will get cancer’: investigating how reasoning accuracy is affected by pictorially presented graphic alcohol warnings. *Alcohol Alcohol* 2015;**50**: 608–16. Oxford University Press. <https://doi.org/10.1093/alcal/agv029>.