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# Where do high-risk drinking occasions occur more often? A cross-sectional, cross-country study

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## Abstract

**Introduction:** The current paper examines the proportion of drinking occasions and total alcohol consumed that takes place at off-premise locations. Comparisons are made between high-income countries: Australia, New Zealand, England and Scotland, and across drinker-types: high-risk and lower-risk.

**Methods:** Data were taken from the International Alcohol Control study in Australia ( $N = 1789$ ), New Zealand ( $N = 1979$ ), England ( $N = 2844$ ) and Scotland ( $N = 1864$ ). The cross-national survey measures location and beverage-specific alcohol consumption. The number of drinking occasions and mean consumption across on- and off-premise locations and the proportion of drinking occasions that high- and lower-risk drinkers had at on- and off-premise locations was estimated for each country.

**Results:** The majority of drinking occasions among high-risk drinkers occurred at off-premise locations across all four countries; Australia 80.1%, New Zealand 72.0%, England 61.7% and Scotland 60.7%. High-risk drinkers in Australia had significantly larger proportions of drinking occasions occurring at off-premise locations compared to England and Scotland. Across all countries, high-risk drinkers and lower-risk drinkers consumed significantly larger quantities of alcohol per occasion at off-premise locations compared to on-premises locations. Finally, the majority of total alcohol consumed occurred at off-premise locations across all countries for high- and lower-risk drinkers.

**Discussion and Conclusions:** As the accessibility to alcohol outside of licensed premises continues to increase, particularly with the expansion of home delivery services, it is important to be mindful of the high proportion of heavy drinking occasions that occur off-premise.

## KEYWORDS

alcohol, cross-sectional, high-risk drinking, off-premise

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## 1 | INTRODUCTION

In 2019, alcohol use was associated with 2 million deaths and was the ninth leading cause of disability-adjusted life years and deaths globally [1]. The majority of these harms arise from heavy or risky drinking [2].

Traditionally, risky alcohol consumption has been associated with on-premise locations such as pubs and bars [3, 4]. For instance, there are studies finding that, drink for drink, drinkers are more likely to experience alcohol-related harms when drinking in an on-premise location than in an off-premise one [3]. An extensive amount of research has been undertaken that focuses on understanding drinking practices in licensed venues such as bars, night-clubs and restaurants [3, 5, 6]. However, there have been recent calls for a greater focus on consumption in off-premise locations, where drinking practices are less regulated than consumption in on-premise locations [7], and total alcohol consumed across occasions is greater [8]. Interventions commonly used in locations like bars and pubs, such as refusal of service to intoxicated individuals or underage drinkers, are not appropriate or feasible in private settings [7]. Alcohol is also cheaper off-premise than it is in licensed premises [9]. For example, in Australia, the mean price of a beer (15 mL of pure ethanol) off-premise was one-third of the on-premise price (US \$1.39 compared to \$4.27 [9]). Despite this, there appears to be a focus on on-premise consumption in studies of alcohol-related harm.

There are indications that heavy drinking is more common in private spaces than previously thought [10, 11]. An Australian study looking at recent heavy drinking occasions by location described 59% of them occurring at off-premise locations [12]. Whether Australia has particularly high rates of off-premise drinking, compared to other countries with a similar drinking culture and policy environment, is unknown.

The aim of the current study is to explore whether these results were unique to Australia or are reflected in other high-income countries with similar drinking cultures. Using cross-national data from the International Alcohol Control study, the current paper examines what proportion of high-risk drinkers' drinking occasions and total and mean alcohol consumed occurs at off-premise locations, and how or whether this differs across four high-income countries: Australia, New Zealand (Aotearoa), England and Scotland and across drinker type through comparisons to lower-risk drinkers.

## 2 | METHODS

### 2.1 | Sample

Data were taken from the International Alcohol Control study; a multi-country study that aimed to assess patterns

of alcohol consumption, purchasing and attitudes towards policies [13]. Ethics approval was obtained by each country through their respective ethics committees. The International Alcohol Control was first conducted in New Zealand in 2011, with other countries adapting the questionnaire for use in their own country. This paper focused on data from Australia, New Zealand, England and Scotland, collected in 2011 or 2013.

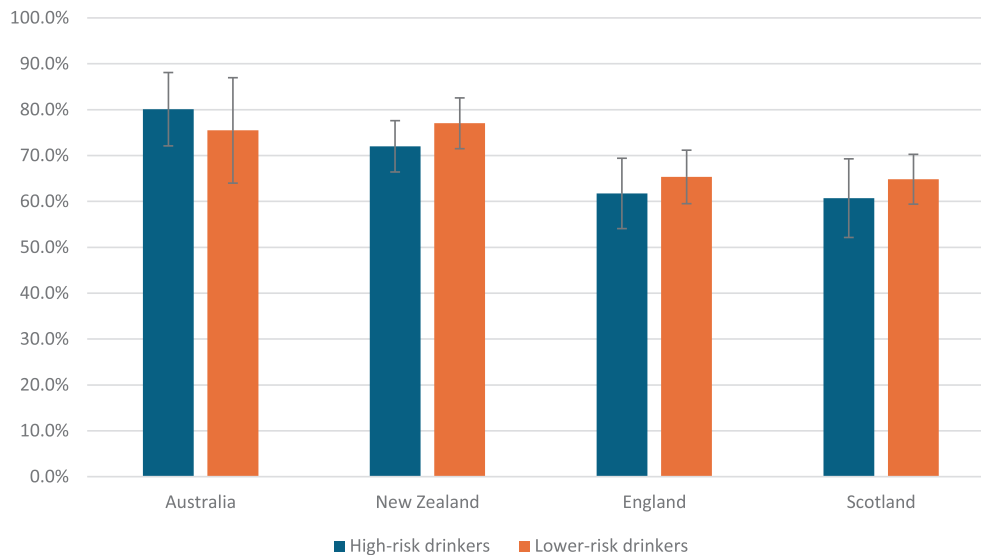
Only respondents aged 16–65 were included so that the age range was consistent in all countries. The total N across the pooled sample was 7462. Risky drinkers (consuming at least 50 g of alcohol on a single occasion at least once a month) were oversampled in Australia; corrected for with weighting. Further details on each individual country's basic sample demographics, methodological approaches, response rates and year they conducted their survey can be found in Table S1, Supporting Information, and in-depth descriptions of survey methods can be found in Huckle et al. [13]. As one person per household was selected for participation in the study, unequal probability of respondent selected was corrected for: post-stratification weights were calculated in each country's sample.

### 2.2 | Survey and variables

Surveys using beverage-specific location-based loops were used. Respondents were first asked to report their frequency of drinking occasions at a list of venues. They then were asked to report how much of each of a list of beverage types they consume on a typical occasion. This measure of alcohol consumption produces higher levels of coverage than other approaches, such as graduated frequency (40–60%) [14]. The proportion of drinking occasions that occurred at on- and off-premise locations were estimated by calculating total drinking occasions that occurred at on-and off-premise (total occasions off or on-premise/total drinking occasions), these were also stratified by drinker type and country. The mean number of grams of pure alcohol consumed at each on and off-premise location was also estimated and stratified by drinker type and country. Finally, the proportion of total alcohol consumed at off-premise locations was calculated (total alcohol consumption off or on-premise/total alcohol consumed across all locations).

#### 2.2.1 | Drinker type

High-risk drinkers were defined as individuals who reported consuming an average of over 300 g of pure alcohol a week. As the definition of high-risk drinking,



**FIGURE 1** The proportion of occasions by high-risk drinkers and lower-risk drinkers that occur off premise across Australia, New Zealand, England and Scotland.

and standard drinks, varies across countries, this threshold was chosen to capture higher levels of consumption across all countries. Lower-risk drinkers were defined as those who consumed, on average, less than 100 g of pure alcohol a week. To clearly delineate between high and low risk drinkers, these variables were defined with a sizable gap in between.

### 2.2.2 | Drinking location

Off-premise locations included the respondent's own home, someone else's home, outdoor public places, workplaces, private motor vehicles (New Zealand). On-premise locations included pubs/hotels/taverns, nightclubs and other clubs, groups or meetings, restaurants, cafes or coffee shops, special events, theatres, sports events, plane/train/bus, bingo halls (England and Scotland only). Further details on these locations can be found in Huckle et al. [13].

### 2.3 | Analysis

Analyses were conducted in Stata version 18 [15] and Microsoft Excel was used to generate graphs. Data were weighted to adjust for the likelihood of being surveyed based on age, sex, location and risky drinking (Australia only) using the 'svy' command suite in Stata. Statistical significance was assessed using non-overlapping 95% confidence intervals.

## 3 | RESULTS

Figure 1 depicts the proportion of occasions that occurred at on- and off-premise locations, by country and drinker type. Across all four countries, the majority of drinking occasions for both drinker types occurred off-premise. High-risk drinkers in Australia had significantly higher proportions of drinking occasions occurring at off-premise locations (80.1%) compared to England (61.7%) and Scotland (60.7%). Across all four countries, high-risk drinkers and lower-risk drinkers did not differ significantly in their proportion of drinking occasions occurring off-premise.

Table 1 displays the mean grams per occasion and overall proportion of pure alcohol consumed at on- and off-premise locations, by country and drinker type. Australian (69.8 g) and Scotland (72.6 g) high-risk drinkers consumed significantly larger quantities of alcohol per off-premise occasion compared to those in England (53.8 g).

Looking at the proportion of total amount of alcohol consumed at locations by country and drinker type, across all four countries the majority of alcohol consumed was done so off-premise and there were no significant differences between high- and lower-risk drinkers.

## 4 | DISCUSSION

Across all four countries, most drinking occasions among high-risk drinkers occurred off-premise. Further, Australian high-risk drinkers had significantly higher proportions of

**TABLE 1** Mean grams of pure alcohol consumed per-occasion at on- and off-premise locations, by drinker type and country, and proportion of total alcohol consumed at off-premise locations.

		Australia	New Zealand	England	Scotland
High risk	On-premise mean grams	56.3 (50.8, 61.8)	34.5 (31.4, 37.5)	38.3 (33.9, 42.6)	41.3 (35.8, 46.9)
	Off-premise mean grams	69.8 (64.7, 74.9)	61.2 (55.9, 66.6)	53.8 (47.0, 60.7)	72.6 (64.9, 80.3)
	Total % alcohol consumed off premise	80.7 (68.2, 93.2)	75.6 (67.2, 80.8)	60.6 (50.0, 71.3)	64.8 (52.8, 76.7)
	% Occasions off	80.1 (72.1, 88.1)	72.0 (66.4, 77.6)	61.7 (54.1, 69.4)	60.7 (52.1, 69.3)
Lower-risk	On-premise mean grams	19.8 (17.8, 21.8)	7.6 (7.1, 8.1)	10.4 (9.5, 11.3)	10.5 (9.7, 11.3)
	Off-premise mean grams	15.6 (13.5, 17.1)	15.2 (14.2, 16.2)	17.5 (16.3, 18.6)	20.8 (19.2, 22.3)
	Total % alcohol consumed off premise	72.0 (63.2, 80.8)	76.4 (72.1, 80.8)	63.3 (58.2, 68.3)	73.1 (67.3, 79.0)
	% Occasions off	75.5 (64.0, 87.0)	77.0 (71.5, 82.6)	65.3 (59.5, 71.2)	64.8 (59.4, 70.3)

drinking occasions occurring at off-premise locations compared to those in England and Scotland. Additionally, across all countries, high-risk and lower-risk drinkers consumed significantly larger quantities of alcohol per occasion at off-premise locations compared to on-premise locations. Finally, for all countries, there were no significant differences between high- and lower-risk drinkers for the proportion of total amount of alcohol consumed at locations.

These findings are fairly consistent with previous analyses examining the percentage of drinkers purchasing alcohol at on-premise or takeaway outlets across countries including Australia, New Zealand, England and Scotland [16]. Australia and New Zealand respondents had higher proportions of their alcohol consumed take-away (Australia, 79%; New Zealand, 75%) than England and Scotland (England, 67%; Scotland, 66%). One reason for England and Scotland having lower proportion of high-risk drinking occasions occurring may be the stronger history of pub culture in England and Scotland and heavy drinking occurring there [5]. Half a century ago, Britain had much more of its alcohol consumption taking place at on-premise locations (mainly pubs) [17]. While this has declined, preferences for on-premise consumption still remain strong in comparison with other countries [16]. Additionally, these countries had lower response-rates, which may be contributing to non-representativeness of drinkers in the sample.

These findings are important in the context of post-COVID-19 changes to alcohol availability for off-premise consumption, at least in Australia. Home delivery services have increased since the time period of data collection, potentially increasing the availability of alcohol through the extension of takeaway alcohol services [18]. Other research on home-delivery services has suggested that age verification practices are weaker than those in physical stores, potentially

increasing availability to minors [19]. Additionally, a 2019 Australian survey found that 17.3% of participants whose last order was a fast home delivery service made the purchase to extend a drinking session [20]. While individuals may drink off premise for various reasons, research examining affordances of home-drinking specifically has suggested that heavy drinkers emphasised the importance of home drinking reducing constraints around intoxication compared to on-premise settings [21]. Given the high levels of off-premise drinking that the current results display, coupled with the increasing accessibility to alcohol off-premise that has occurred since data collection, more research is needed focusing on reducing harmful off-premise alcohol consumption.

This study is not without its limitations. First, there were low response rates in some of the countries (particularly England, and Scotland). This could lead to the possibility that fewer high-risk drinkers were included in the current study from those countries. Second, as is the case for all surveys measuring alcohol consumption by self-report, there is often substantial under-reporting of alcohol consumption [22]. This is less of an issue with the International Alcohol Control dataset, however, with the within-location beverage-specific alcohol consumption items used in the survey capturing high coverage levels of per capita consumption [23]. Finally, it is important to note that these results were collected prior to an important change in alcohol policy for Scotland. Minimum unit pricing was introduced in 2018 in Scotland, with the lowest legal price a standard drink of alcohol could be sold for set at £0.50 [24]. This primarily affected the price of alcohol for off-premise consumption. The current results should thus be interpreted with caution, as they are relevant to a pre-minimum unit price Scotland, with conflicting evidence of changes in characteristics of drinking occasions for high-risk drinker post policy implementation [25, 26].

## 4.1 | Implications for public health

This study highlights the importance of off-premise drinking being a focus for future alcohol research that examines ways to reduce the harmful consumption of alcohol. In discussions of the expansion of home delivery and its regulation, the high proportion of drinking occasions that occur off-premise, particularly among high-risk drinkers, should be kept in mind. Given that home delivery services are only set to increase, examining ways to minimise harms associated with off-premise consumption and its potential increase is vital.

### 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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### CONFLICT OF INTEREST STATEMENT

None to declare.

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## SUPPORTING INFORMATION

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

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