

Alcohol Off-licence Purchases and Subsequent Harm

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COMMISSIONING CONTACT'S COMMENTS

The Health Promotion Agency (HPA) commission was managed by Kerri Kruse, Researcher, who also authored this report.

The research was undertaken to understand the trends and patterns related to off-licence alcohol purchasing in Wellington, as well as the subsequent alcohol-related harms that occur. The findings provide a snapshot of behaviours that may provide contextual information for local governments in developing their Local Alcohol Policies.

Research First was commissioned to carry out the data collection activities for this project, which consisted of helping HPA to develop the research design and data collection instruments; hiring, training, and managing interceptors to recruit study participants; conducting online and telephone surveys; developing a data set; and drafting a method report. Analyses and reporting (other than the method report) were managed internally at HPA.

The research design involved intercepting people who were purchasing alcohol from off-licensed premises on weekend evenings in the Wellington city centre and inviting them to participate in the study. As a result, the study sample is not intended to be representative of the Wellington population. Given its cross sectional nature, the study can assess associations between the independent variables and alcohol-related harm, but cannot demonstrate causality between them.

A summary report of the current findings (*Alcohol Off-licence Purchases and Subsequent Harm: Summary Report*) is available from <http://www.hpa.org.nz/research-library/research-publications>.

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HPA would like to thank those respondents who took the time to participate in this research. Their experiences and insights will be used to better understand the alcohol-related harm that occurs in Wellington. HPA would also like to acknowledge the work done by Jaime Dyhrberg and Macaela Flannigan at Wellington City Council, who supported the study from its inception to the reporting.

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INTRODUCTION

NATIONAL AND INTERNATIONAL CONTEXT

In response to a comprehensive issues paper describing how alcohol is used and the consequences arising from overconsumption in New Zealand,^[1] the Sale and Supply of Alcohol Act 2012 ('the Act') was passed, with the aim to reduce alcohol-related harm (ARH) through a number of policy interventions.^[2] The Act permits city and district councils (local governments) to develop Local Alcohol Policies (LAPs) that guide the sale and availability of alcohol for both on-licensed (where alcohol is consumed on-site) and off-licensed (where alcohol is purchased on-site but consumed off-site) premises. As a result, local governments are carefully considering the number of licensed premises, their location, and their hours of operation.^[3] To help inform these policy decisions, more evidence is needed in the local context regarding the prevalence and nature of ARH.^[4]

Various New Zealand studies have analysed the experience of self-reported ARH in different timeframe contexts. For instance, in relation to respondents' last drinking occasion, Attitudes and Behaviours toward Alcohol Surveys (ABAS) from 2010 to 2012 show that, among those who reported being intoxicated or having too much to drink, young adults are more likely than the general population to experience negative short-term effects (eg, loss of memory, hangover, vomiting; 40% of those aged 18 to 24, compared with 19% of all age groups).^[5] In another study that asked about ARH occurring in the previous four weeks (eg, spending too much money on alcohol, failure to meet work or family or study commitments or responsibilities, injuring themselves, getting into a fight), 19% of respondents reported at least one harm, with males, young people aged 18 to 24, and Pacific people more likely to experience harm than other groups.^[6] Other research has assessed ARH experienced in the last 12 months. One study reported harm to physical health as the most common ARH among drinkers (8.0% prevalence), followed by financial harms (5.8%), social harms (5.3%), and negative impacts on mental health (4.6%).^[7] The authors also reported that males and young people aged 15-34 years were more likely to experience harm to physical health and social harms, and males were more likely to report financial harms. In another study, 33.8% of current drinkers reported personal problems arising from their own drinking in the last 12 months, with males and younger people more likely to experience these.^[8]

The evidence regarding ARH in relation to licensed premises' density and opening hours is scarce, both within New Zealand and internationally. Several studies have used administrative sources of ARH data to investigate the association between the availability of alcohol and ARH. For example, two international review studies assessed the impact of density of alcohol outlets and/or of premises' hours and days of operation on various measures of ARH and concluded that restricting the availability of alcohol may be one promising strategy to reduce ARH.^[9,10] One New Zealand study found a relationship between off-licensed outlet density and violent events.^[11] Other policy and licensing changes have been analysed in the context of on-licensed and/or off-licensed premises to understand their impact on hospital admission rates and emergency department presentations.^[12-14] While these studies provide important population-level evidence for supporting

alcohol policy interventions, none has connected the alcohol purchase directly to the purchaser's subsequent experience with alcohol.

LOCAL CONTEXT

In consideration of its provisional LAP, Wellington City Council (WCC) developed its Alcohol Management Strategy ('the Strategy'), which includes a proposed initiative to limit off-licence trading hours. The Strategy included the possibility of conducting a trial to measure the impact of reducing off-licence trading hours to a 9pm maximum closing time (currently it is 11pm). This idea was proposed to help address concerns about pre-loading and side-loading behaviours that Wellington residents raised during a community engagement exercise^[15]. The earlier closing time may present one way of reducing the opportunity to consume excessive alcohol, as New Zealand evidence indicates that drinkers who purchase alcohol at later times are more likely to be heavy drinkers compared with those who purchase at earlier times ^[16].

In 2014, WCC created a steering group comprising the Police, the Medical Officer of Health, Progressive Enterprises, Foodstuffs, Super Liquor, Lion, Liquorland, Independent Liquor, Retail New Zealand, and the New Zealand Association of Dairies, Groceries and Small Businesses. The steering group explored creating a voluntary accord among represented off-licensed premises in WCC's jurisdiction, whereby the retailers agreed in principle to a maximum closing time of 9pm for a limited period of time in order to carry out a trial that would measure any outcomes of the accord. The steering group invited the Health Promotion Agency (HPA) to be involved in the trial. The intention was for a study comprising a baseline (pre-accord), intervention (while the accord would be in place), and follow-up (post-accord) period to be developed and managed by HPA as an impartial organisation that works to promote public health in the area of minimising alcohol-related harm. The purpose of the trial would have been to explore any changes in purchase and consumption patterns and alcohol-related harms during and after a short period of time of reducing off-licences' trading hours to a closing time of 9pm. The findings would have been used to help inform the development of WCC's LAP, and possibly those of other councils as well.

HPA contracted a research provider, Research First, to carry out the data collection activities. Subsequently, the steering group decided that it would not commit to the accord. As a result, HPA continued with what would have been the baseline period of the trial and dropped the intervention and follow-up periods from the method. The results from this revised cross-sectional study are discussed in this report. The research serves as a snapshot of the purchasing and consumption patterns and ARH occurring subsequent to off-licence purchases in the Wellington City CBD. It also explores risk factors for experiencing ARH as well as aspects of the purchasing context that may be related to experiencing ARH.

The aim of this research is to assess the extent of ARH experienced by respondents after they purchase alcohol from off-licensed premises and the relative contribution of each of the different harms to overall harm prevalence. We investigated who may be more likely to experience these consequences as well as certain circumstances of the off-licence purchases to examine if they are related to experiencing harm. The findings provide contextual insight that may play a role in helping to guide the direction of alcohol policy development.

METHOD

RESEARCH DESIGN AND DATA COLLECTION

Data were collected in the months of June through August 2015 in the Wellington City CBD. The study employed an intercept research design, which has been used in other research looking at alcohol consumption and related harms.^[17,18] It aids recall and allows the harms to be directly linked to the respondents who experienced them. Interceptors were positioned outside off-licensed premises (supermarkets, liquor stores, and grocery stores that sell alcohol) from 7pm until 11pm on a total of 10 Friday and Saturday evenings. Fourteen premises (the majority of the off-licensed premises in the Wellington CBD) were initially included in the study, but two were abandoned part-way through fieldwork as they turned out to be logistically difficult to recruit from. (Note that the data collected prior to those locations being abandoned were retained in the analyses.) People exiting the premises who had purchased alcohol were approached by the interceptors and invited to participate in the study in exchange for a small incentive. The response rate at intercept was not fully recorded, but it was estimated at approximately 50%, based on the last 6 days of data collection. Upon receipt of respondents' consent to participate, a short questionnaire was administered at intercept that collected contact information and data on their purchases and alcohol-related behaviours that occurred that day prior to intercept. A link to the follow-up online survey was emailed the following afternoon. The follow-up survey included questions on demographics, alcohol consumption, and events that occurred on the evening of intercept. Reminder emails and text messages were sent to encourage participation. Those who did not respond subsequent to these reminders were telephoned and administered the survey via Computer Assisted Telephone Interviewing (CATI). A prize draw for a travel voucher was included as an incentive to complete the follow-up survey. Ethical approval of this study was granted by the New Zealand Ethics Committee, NZEC 15 #21. Additional details on the method are published in the Method Report.^[19]

INDEPENDENT VARIABLES

The following independent variables were collected at intercept: evening of intercept (Friday, Saturday); the time that respondents started drinking that day (if alcohol had been consumed: before 5:00pm, 5:00-6:59pm, and 7:00pm or later); whether or not consumption of alcohol occurred prior to intercept (as reported that no alcohol had been consumed when asked the time that drinking started that day); the type of alcohol purchased (beer, cider, Ready to Drink beverages (RTDs), spirits, wine); purchase type (planned, opportunistic); gender; age (18-22 years, 23-27 years, 28-32 years, 33-37 years, 38 years or older); time of alcohol purchase (7:00-8:59pm, 9:00-11:00pm); and type of premises where the purchase was made (supermarket, liquor store, grocery store).

The following additional independent variables were collected at follow-up: ethnicity (prioritised into mutually exclusive groups: Māori, Pacific, Asian, Other, New Zealand European);^[20] ward of residence (Eastern, Lambton, Northern, Onslow-Western, Southern);¹ post-purchase destination

¹ For the geographic boundaries of the wards referred to in this report, see:

<http://wellington.govt.nz/~media/your-council/elections/2016/files/all-wltn-wards2016-2019.pdf>

(went home only, went out); time that alcohol consumption stopped on the evening of intercept (before 11:00pm, 11:00pm-12:59am, 1:00am-2:59am, 3:00am or later); and total number of drinks consumed that evening.

DEPENDENT VARIABLES

The follow-up survey asked about potentially harmful experiences (herein referred to as 'harms' or 'ARH') that occurred on the evening of intercept. Questions relating to ARH were adapted from the ABAS^[5] and from the definition of ARH in the Sale and Supply of Alcohol Act 2012^[2]. The Act defines ARH broadly and includes '(a) any crime, damage, death, disease, disorderly behaviour, illness, or injury, directly or indirectly caused, or directly or indirectly contributed to, by the excessive or inappropriate consumption of alcohol; and (b) any harm to society generally or the community, directly or indirectly caused, or directly or indirectly contributed to, by any crime, damage, death, disease, disorderly behaviour, illness, or injury of a kind described in paragraph (a).'^[2] In consideration of the Act's definition of harm, the method in this study also employed a broad definition of harm that includes social, financial, and physical harms as well as consumption-related harms such as getting drunk and drinking too much, which can have disease and health implications over the short or long term^[21].

Two categories of harms were created for the purpose of this report. The first includes all harms from the questionnaire. The total number of harms that each respondent reported having experienced was calculated to create a 'number of harms' variable. The second category consists of a subset of the harms from the first, and includes only those harms whose prevalence was less than 10%. Thus, it includes a range of social, financial and/or physical harms but excludes the harms related to getting drunk, drinking too much, having a hang-over, and spending too much money on alcohol. This second category is referred to as 'low-prevalence harms' and was created to analyse those experiences that may be more severe given their lower frequency of occurring. In addition, given the broad definition of harm as defined by the Act, this low prevalence harm category presents an opportunity to analyse harms according to a narrower definition, which may be more suitable in some contexts beyond that of the Act.

STATISTICAL ANALYSES

Analyses were completed using Stata 13.1 (College Station, TX). Descriptive statistics were conducted to measure the prevalence of each reported harm. Univariate logistic regression was used to assess the gender differences found in experiencing each of the individual harms. Two-sample t tests were run to assess differences in the mean number of drinks and mean number of harms by certain subgroups.

The two harm categories were analysed separately. For all harms, 'number of harms' was treated as an ordinal variable with the outcomes of experiencing '0 harms', '1 harm', '2 harms', and '3 or more harms'. 'Low-prevalence harm' was treated dichotomously as having experienced at least one of the low-prevalence harms or not.

As an ordinal variable, 'number of harms experienced' was first regressed on all independent variables, and coefficients were estimated using the generalised ordered logit model^[22]. This test

was selected due to the non-normal distribution of the number of harms, which precluded the ability to use linear regression, and due to the proportional odds assumption being violated for ordinal logistic regression. Non-significant variables were removed from the model one by one until only those that were statistically significant remained.

As a dichotomous variable, 'low-prevalence harm' was first tested in a multiple logistic regression model that included all independent variables. Most non-significant variables were removed from the model, with the exception of a few variables of interest that were left in the model for illustrative purposes. This final model assessed the impact of the independent variables on experiencing one or more 'low-prevalence harms'.

RESULTS

SAMPLE CHARACTERISTICS

A total of 1,998 respondents completed the online follow-up survey, representing 45.6% of those who completed the intercept survey. Respondents who reported at follow-up that they had not consumed at least some of the alcohol that they purchased on the evening of intercept (or who were unsure) were removed from the analyses, as were those with missing age data or who reported being younger than 18 years old (one respondent reported being aged 17). This resulted in 1,794 respondents available for analyses, or 41.0% of those of those who completed the intercept survey (Table 1).

Overall, the sample included a large percentage of younger people, with 18 to 22-year-olds representing the biggest age group (47.9%). The majority of the sample resided in the Lambton ward (72.4%), and there were more males (55.1%) than females. The sample achieved at follow-up was similar to the sample who completed the intercept survey by age group and purchase type; however, slightly fewer males completed the follow-up survey. About half (53.5%) of respondents consumed alcohol prior to intercept, and 21.5% went home after intercept and stayed home for the remainder of the evening.

Table 1. Sample characteristics*

	Completed intercept interview		Available for follow-up analyses	
	n	%	n	%
Gender				
Male	2,564	58.5	988	55.1
Female	1,815	41.4	806	44.9
Age				
18-22	2,148	49.0	860	47.9
23-27	1,163	26.6	513	28.6
28-32	474	10.8	197	11.0
33-37	163	3.7	74	4.1
38 or older	345	7.9	148	8.3
Over 18 (unspecified)	2	0.1	2	0.1
Ethnicity**				
Māori	N/A	N/A	163	9.1
Pacific	N/A	N/A	59	3.3
Asian	N/A	N/A	97	5.4
Other	N/A	N/A	231	12.9
NZ European	N/A	N/A	1,235	68.8
Evening of intercept				
Friday	2,707	61.8	1,091	60.8
Saturday	1,673	38.2	703	39.2
Premises type				
Supermarket	1,101	25.6	444	24.8
Liquor Store	3,100	72.1	1,301	72.7
Grocery store	97	2.3	45	2.5
Ward				
Eastern	N/A	N/A	138	9.3
Lambton	N/A	N/A	1,073	72.4
Northern	N/A	N/A	34	2.3
Onslow-Western	N/A	N/A	112	7.6
Southern	N/A	N/A	126	8.5
Alcohol consumed prior to intercept				
Yes	2,315	52.9	960	53.5
No	2,065	47.2	834	46.5
Purchase type				
Planned	3,441	78.6	1,448	80.7
Opportunistic	911	20.8	335	18.7
Post-purchase destination				
Home only	N/A	N/A	385	21.5
Went out	N/A	N/A	1,409	78.5
Number of drinks consumed (Mean = 7.9)				
1 to 3	N/A	N/A	316	17.6
4 to 6	N/A	N/A	492	27.5
7 to 9	N/A	N/A	395	22.1
10 or more	N/A	N/A	588	32.8
Total	4,380		1,794	41.0

*May not sum to the totals due to missing responses or refusals

**Prioritised by Māori, Pacific, Asian, Other, and New Zealand European.

PREVALENCE OF ALCOHOL-RELATED HARMS

The most prevalent harm reported was 'I got drunk' (47.8%), followed by 'I had a hangover the next day' (30.2%; Table 2). Smaller percentages reported that they 'had too much to drink' (13.9%) or 'spent too much money on alcohol' (12.5%). Among those who reported that they got drunk, 24.4% also reported that they drank too much. The remaining harms had a prevalence of less than 10% and are considered the 'low-prevalence harms'.

Compared with females, males were more likely to report getting drunk (odds ratio [OR] = 1.31, 95% confidence interval [CI]: 1.09-1.58) and being involved in anti-social behaviour in public (OR = 5.54, 95% CI: 2.15-14.25) and less likely to report feeling depressed/getting emotional (OR = 0.62, 95% CI: 0.41 - 0.96), getting injured (OR = 0.60, 95% CI: 0.37-0.97), and experiencing an unwanted sexual advance from someone (OR = 0.49, 95% CI: 0.30-0.81).

Table 2. Prevalence of alcohol-related harms experienced and gender differences

Harm	Overall		Females	Males	OR (95% CI)
	n	%	%	%	Ref = female
I got drunk	857	47.8	44.0	50.8	1.31 (1.09-1.58)**
I had a hangover the next day	542	30.2	28.2	31.9	1.19 (0.97-1.46)
I had too much to drink	249	13.9	13.4	14.3	1.08 (0.82-1.41)
I spent too much money on alcohol	224	12.5	11.5	13.3	1.17 (0.88-1.56)
I did something embarrassing that I regretted later	119	6.6	7.0	6.4	0.91 (0.63-1.32)
I felt depressed or got upset or emotional	91	5.1	6.3	4.1	0.62 (0.41-0.96)*
I smoked or took drugs which I normally wouldn't do	88	4.9	5.1	4.8	0.93 (0.61-1.43)
I had a sexual encounter that I normally wouldn't have had	82	4.6	3.6	5.4	1.52 (0.96-2.41)
I got sick (eg, vomited) from drinking too much	77	4.3	4.3	4.3	0.98 (0.62-1.55)
I injured myself (eg, tripped over, accidental harm)	70	3.9	5.0	3.0	0.60 (0.37-0.97)*
I experienced an unwanted sexual advance from someone	68	3.8	5.2	2.6	0.49 (0.30-0.81)**
I got into a fight (verbal or physical)	48	2.7	2.4	2.9	1.25 (0.70-2.25)
I didn't meet social responsibilities (eg, family, friends)	45	2.5	2.2	2.7	1.23 (0.67-2.25)
I felt unsafe / I got into a situation where I felt uncomfortable	39	2.2	2.6	1.8	0.69 (0.37-1.31)
I was involved in anti-social behaviour in public (eg, urination, nudity, or sexual act)	38	2.1	0.6	3.3	5.54 (2.15-14.25)***
I lost/broke/had stolen something valuable (eg, phone, wallet, watch)	34	1.9	2.4	1.5	0.64 (0.32-1.26)
I didn't meet work responsibilities	20	1.1	0.7	1.4	1.92 (0.73-5.01)
I had an encounter with the police	17	1.0	0.5	1.3	2.67 (0.87-8.23)
I was involved in a crime	14	0.8	0.4	1.1	3.01 (0.84-10.84)
I drove a vehicle while unsure of how much I was under the influence	9	0.5	0.3	0.7	2.87 (0.59-13.84)

*** $p < .001$ ** $p < .01$ * $p < .05$

NUMBER OF HARMS EXPERIENCED

Table 3 shows the proportion of people reporting having experienced certain numbers of harms, by selected independent variables. The percentage of respondents who experienced at least one harm was 63.4%, with 22.4% reporting that they experienced three or more harms. Compared with females, males had a higher prevalence of having experienced at least two harms (combined 40.9% versus combined 35.2%); females had a slightly higher prevalence of having experienced no harms. However, the mean number of harms experienced by males (1.58, 95% CI: 1.47-1.69) and females (1.46, 95% CI: 1.33-1.58) was not statistically different ($t = 1.42$, $df = 1791$, $p = .16$), nor was the median (1 harm).

There appears to be a clear, negative linear relationship between age group and number of harms; that is, as age increases, the number of harms experienced decreases. It also appears that going out after intercept, drinking sessions that ended later in the evening, number of drinks consumed, and purchases made in liquor stores are associated with a greater number of harms experienced. These apparent differences in prevalence are tested for their statistical significance in the model described in the next paragraph.

Table 3. Proportion reporting 0, 1, 2, or 3+ harms, by independent variables

	Number of harms experienced			
	0 %	1 %	2 %	3 or more %
Overall	36.7	25.0	16.0	22.4
Gender				
Males	35.0	24.1	17.7	23.2
Females	38.7	26.1	13.9	21.3
Age group				
18-22	25.8	29.0	18.0	27.1
23-27	38.2	23.0	18.1	20.7
28-32	43.1	23.4	13.2	20.3
33-37	58.1	18.9	10.8	12.2
38 or older	74.3	14.2	3.4	8.1
Evening of intercept				
Friday	38.7	23.5	14.5	23.3
Saturday	33.4	27.3	18.4	20.9
Alcohol consumed prior to intercept				
Yes	33.8	24.3	16.7	25.2
No	39.3	25.8	15.2	19.1
Purchase time				
7:00-8:59pm	37.5	26.0	15.4	21.1
9:00-11:00pm	34.6	22.9	17.3	25.2
Premises type				
Supermarket	46.9	22.1	12.6	18.5
Liquor Store	33.0	25.9	16.9	24.2
Grocery Store	40.0	24.4	24.4	11.1
Purchase type				
Planned	34.9	25.6	16.5	23.1
Opportunistic	43.6	22.7	14.3	19.4
Post-purchase destination				
Home only	60.8	20.5	8.3	10.4
Went out	30.0	26.2	18.1	25.6
Time stopped drinking alcohol				
Before 11:00pm	69.1	19.4	4.6	6.8
11:00pm-12:59am	40.2	30.0	11.3	18.5
1:00-2:59am	19.6	22.2	26.5	31.7
3:00am or later	8.7	25.0	26.0	40.4
Number of drinks consumed				
Mean	4.6	8.0	10.2	11.4
1 to 3	82.9	12.0	2.2	2.9
4 to 6	56.9	27.4	9.2	6.5
7 to 9	18.5	35.8	20.6	25.1
10 or more	6.8	22.8	26.2	44.2

Multivariable analyses

Table 4 reports the adjusted multivariable model (model $p < .001$) of number of harms experienced and includes the independent variables found to be statistically significant after controlling for all of them together: gender, age group, purchase time, type of premises where the alcohol was purchased, post-purchase destination, time stopped drinking alcohol, and number of drinks consumed. The remaining independent variables were not statistically significant and are not included in the model. Generalised ordered logit regression presents results as three sets of coefficients expressing dichotomous relationships: the first compares 0 harms with 1, 2, and 3 (or more) harms; the second compares 0 and 1 harm with 2 and 3 (or more) harms; and the third compares 0, 1, and 2 harms with 3 (or more) harms. Number of alcoholic drinks consumed was the most relevant variable in terms of association with the number of ARHs experienced ($z = 12.50-15.65$). Females, younger age groups, respondents who purchased alcohol from 9:00-11:00pm (compared with 7:00-8:59pm) or from supermarkets or liquor stores (compared with grocery stores), those who went out after their purchase, and those who stopped drinking later in the evening were more likely to experience a greater number of harms while controlling for the number of drinks that were consumed.

Because the time the person stopped drinking alcohol and the number of drinks consumed have different coefficients across the harm comparison groups, this means that their effects have slightly different magnitudes. For example, time that alcohol consumption stopped has the strongest relationship with the number of harms experienced when comparing fewer than two harms with two or more harms ($\beta = 0.42$). Similarly, number of drinks consumed has a slightly stronger relationship with the number of harms experienced when comparing no harm with one or more harms ($\beta = 0.36$).

Table 4. Estimated effects of independent variables on number of harms experienced

	Number of harms experienced								
	0 versus 1, 2, 3+			0 & 1 versus 2 & 3+			0, 1, 2 versus 3+		
	β	SE	z	β	SE	z	β	SE	z
Gender (Ref=female)	-0.56***	0.10	-5.54	-0.56***	0.10	-5.54	-0.56***	0.10	-5.54
Age group	-0.24***	0.04	-5.49	-0.24***	0.04	-5.49	-0.24***	0.04	-5.49
Purchase time (Ref=7:00-8:59pm)	0.27**	0.10	2.70	0.27**	0.10	2.70	0.27**	0.10	2.70
Premises type (Ref=grocery store)									
Supermarket	0.74*	0.32	2.30	0.74*	0.32	2.30	0.74*	0.32	2.30
Liquor store	0.76*	0.31	2.45	0.76*	0.31	2.45	0.76*	0.31	2.45
Post-purchase destination (Ref=went out)	-0.44**	0.13	-3.40	-0.45**	0.13	-3.51	-0.45**	0.13	-3.51
Time stopped drinking alcohol	0.35***	0.08	4.48	0.42***	0.07	5.86	0.16*	0.08	2.03
Number of drinks consumed	0.36***	0.02	15.65	0.26***	0.02	15.00	0.22***	0.02	12.50

*** $p < .001$ ** $p < .01$ * $p < .05$

EXPERIENCE OF LOW-PREVALENCE HARMS

Analyses were undertaken to examine the experience of a 'low-prevalence harm' (Table 5). Overall, 28.1% of the sample experienced at least one of these harms, while a very small percentage (4.6%) experienced three or more.

Table 5. Proportion reporting 0, 1, 2, or 3+ low prevalence harms, by independent variables

	Number of low prevalence harms experienced			
	0	1	2	3 or more
	%	%	%	%
Overall	71.9	17.3	6.1	4.6
Gender				
Males	72.7	16.6	5.9	4.9
Females	71.0	18.2	6.5	4.3
Age group				
18-22	63.4	22.6	7.7	6.4
23-27	76.2	14.0	5.9	3.9
28-32	76.7	16.8	4.1	2.5
33-37	86.5	8.1	2.7	2.7
38 or older	93.2	4.1	2.0	0.7
Evening of intercept				
Friday	72.9	17.2	5.9	4.0
Saturday	70.4	17.5	6.5	5.6
Alcohol consumed prior to intercept				
Yes	71.8	17.7	5.6	4.9
No	72.1	16.9	6.7	4.3
Purchase time				
7:00-8:59pm	72.3	16.5	6.8	4.4
9:00-11:00pm	71.2	18.4	5.0	5.3
Premises type				
Supermarket	76.6	14.2	5.4	3.8
Liquor Store	70.0	18.4	6.5	5.1
Grocery Store	80.0	17.8	2.2	0.0
Purchase type				
Planned	71.6	17.6	6.4	4.4
Opportunistic	72.8	16.4	5.4	5.4
Post-purchase destination				
Home only	80.8	14.0	2.6	2.6
Went out	69.5	18.2	7.1	5.2
Time stopped drinking alcohol				
Before 11:00pm	85.0	10.4	3.0	1.6
11:00pm-12:59am	73.9	15.9	6.8	3.4
1:00-2:59am	64.2	22.2	7.5	6.1
3:00am or later	60.6	22.6	6.3	10.6
Number of drinks consumed				
Mean	7.1	9.2	10.2	12.2
1 to 3	88.6	9.5	1.3	0.6
4 to 6	83.7	10.6	4.1	1.6
7 to 9	66.3	22.5	7.3	3.8
10 or more	56.8	23.6	9.7	9.9

The following analyses assess the *likelihood* of experiencing at least one low prevalence harm (ie, the dichotomous outcome of experiencing at least one of these harms or not experiencing any). All independent variables were initially included in the model for low-prevalence harm to test which were statistically significant. Most insignificant variables were then removed from the analyses to achieve a simpler, more efficient model. Table 6 shows the statistically significant variables that are related to experiencing at least one 'low-prevalence harm' along with their adjusted odds ratios (AORs). These include: being female, being in younger age groups, living in the Onslow-Western ward, the number of drinks consumed, and having purchased alcohol at a liquor store. The mean number of drinks was higher among respondents who experienced a low-prevalence harm compared with those who did not (9.93 [95% CI: 9.52-10.34], compared with 7.09 [95% CI: 6.85-7.32], $p < .001$). Purchase time, having purchased alcohol at a supermarket, post-purchase destination, and time that drinking stopped were not statistically significant when analysing low-prevalence harms and controlling for the other variables. These non-significant variables were left in the model and presented in Table 6 for illustrative purposes only.

Table 6. Multivariable logistic regression of independent variables on the experience of low-prevalence harms

	AOR	95% CI
Gender (Ref = males)		
Females	1.66	1.27-2.18***
Age group (Ref = 38 or older)		
18-22	5.25	2.17-12.67***
23-27	3.16	1.29-7.72*
28-32	2.98	1.16-7.63*
33-37	2.11	0.70-6.42
Ward (Ref = Onslow-Western)		
Eastern	0.49	0.27-0.88*
Lambton	0.46	0.30-0.72**
Northern	0.22	0.08-0.66**
Southern	0.43	0.23-0.78**
Number of drinks consumed	1.15	1.11-1.19***
Purchase time (Ref = 7:00-8:59pm)		
9:00-11:00pm	1.10	0.84-1.44
Premises type (Ref =grocery store)		
Supermarket	2.56	0.98-6.65
Liquor store	3.01	1.19-7.59*
Post-purchase destination (Ref = home only)		
Went out	1.00	0.72-1.40
Time stopped drinking alcohol (Ref = before 11pm)		
11pm-12:59am	0.98	0.66-1.44
1-2:59am	1.20	0.78-1.84
3am or later	1.05	0.61-1.83

*** $p < .001$ ** $p < .01$ * $p < .05$

CONCLUSION

SAMPLE DEMOGRAPHICS

The sample achieved in this study gives an indication of the demographic makeup of people who purchase alcohol from Wellington's off-licensed premises on weekend evenings in winter: primarily young people, with those aged 18 to 22 years comprising the largest age group, as well as slightly more males than females.

HARM PREVALENCE

The two harms that were most prevalent were the ones directly related to alcohol overconsumption: getting drunk and having a hangover the next day. Interestingly, a much smaller percentage of respondents reported that they drank too much. This finding may reflect attitudinal norms about drinking. For example, 53% of New Zealanders agree that 'Binge drinking is part of the Kiwi culture' and younger adults aged 18 to 24 years are more likely to agree with the statement 'It's ok to get drunk as long as it's not every day'.^[23]

We found that 63.4% of respondents experienced at least one ARH, and 22.4% reported experiencing three or more ARH. Experiencing at least one of the low-prevalence harms was reported by 28.1% of the sample, a rate that is higher than in the ABAS study, where 19% of New Zealanders who drank too much or who were intoxicated on the last drinking occasion reported short term effects, such as loss of memory, vomiting, or a hangover.^[5] These rates are not comparable, however, as there are differences between the studies in the scope of harm, sample demographics, research design, and rate denominators (ie, all respondents versus those who reported having drunk heavily).

RISK FACTORS FOR HARM

Among the various demographic variables that were tested with regards to their relation to experiencing ARH (when treated as an ordinal variable), gender and age group were found to be statistically significant. We found a clear negative relationship between age group and the number of harms experienced. It is well-established that younger people are at a higher risk for ARH in New Zealand,^[6-8,24] and our findings indicate that this increased risk is evident even when comparing the younger age groups with each other (eg, 18- to 22-year-olds with 23- to 27-year-olds). Ethnicity was not found to be a statistically significant factor in either model of ARH, a finding that contrasts with other evidence that Māori ^[7,8] and Pacific people ^[6] may exhibit greater risk. This may be due to insufficient numbers of Māori and Pacific people in the sample to detect statistically significant differences in the numbers of harms experienced.

The fact that females were found to be likely to experience a greater number of harms is a finding that should be interpreted carefully. Women and men reported a similar number of harms (as seen in similar mean and median values), and the gender variable was found to be significant when 'number of drinks consumed' was controlled for in the multivariable model. When the model was run without 'number of drinks' included, gender was no longer significant. Generally speaking,

females metabolize alcohol more slowly and would be more intoxicated if they were to consume the same amount as males.^[25] This phenomenon may explain why the full model indicated females being at higher risk for ARH when other variables are adjusted for, because the model standardises number of drinks consumed when assessing the other variables. New Zealand women's amount and frequency of drinking alcohol have increased from 1995 to 2011.^[26] In this study, it appears that females are not experiencing less ARH compared with males, which contrasts other New Zealand research findings.^[7,8]

In this study, amount of alcohol consumed was measured by self-reported total number of drinks, which was the biggest predictor of experiencing ARH. It is established that alcohol has a causal impact on certain illnesses, accidents, injuries, and types of violence.^[27] Although causality between alcohol consumption and the experience of ARH cannot be established in this study, the findings demonstrate a strong association between the two variables.

The behavioural patterns significantly associated with the number of harms reported were the purchase time, type of premises where alcohol was purchased, post-purchase destination, and the time that drinking stopped. Later purchase time may be related to time that drinking stopped and the amount of alcohol consumed, but it remained significant when controlling for these variables. With regards to those respondents who went home after their purchase, perhaps they experienced fewer harms because they were not in premises that sold alcohol and had potentially lower exposure to other intoxicated people. Also of note is the finding that the time that drinking stopped was found to be statistically significant in its relation to ARH despite controlling for the number of drinks consumed. That is, the time that drinking stops is not simply a proxy for the amount of consumption, and there appears to be a relationship between this pattern of drinking and the experience of ARH. The reason for this is unclear but may be due to the changing environment, particularly with regards to the number of other people present who are more likely to be intoxicated later in the evening and who may contribute to the occurrence of ARH.

When ARH was treated dichotomously as low-prevalence harm, the results were similar in that gender, age group, purchases made at liquor stores, and number of drinks remained statistically significant. Purchase time, purchases made at supermarkets, post-purchase destination, and time that drinking stopped were no longer significant in the full model. It is unclear why these variables were no longer significant in their relationship with low-prevalence harm, but it appears that their impact may be stronger on the more prevalent consumption-related harms, as opposed to other, less frequent harms. Ward became significant for low-prevalence harm, an unexpected finding in light of previous research showing that people from the Onslow-Western ward who purchased alcohol at off-licensed premises on a weekend evening were more likely to drink the alcohol at home and less likely to report that they planned to go out later that evening.^[28] The current study may differ in this finding due to differences in research aims, design, or methodology.

It should be noted that the results of both models regarding type of premises should be viewed with caution when comparing grocery stores to liquor stores and supermarkets. While the models indicate statistically significant relationships, the number of purchases made at grocery stores is low and the findings should therefore be viewed conservatively. A larger sample size of those who purchased at grocery stores would yield more confident findings. When comparing liquor stores to

supermarkets in either harm model, there were no statistically significant differences in experiencing harms.

LIMITATIONS

Data were collected by self-report, which presents some potential challenges to analyses. Social desirability bias and recall bias may be present when analysing the amount of alcohol consumed and the related behaviours and harms. The clear relationship between the reported number of drinks consumed and the experience of ARH, however, helps to support the validity of the alcohol consumption variable. Given the two different data collection modes (online or via telephone), we assessed the possibility of mode effects by running t-tests on the number of drinks consumed and on the number of harms reported by survey administration style and found no statistically significant differences [drinks: 7.79 (online) vs 8.12 (telephone), $t=-1.40$, $df=1,789$, $p=0.161$] [harms: 1.54 (online) vs 1.48 (telephone), $t=0.67$, $df=1,791$, $p=0.504$].

The purpose of the study was to examine ARH occurring in a particular timeframe in one city, which provides a snapshot of behaviours among the study sample. The findings may be limited to the Wellington context and not applicable to other communities. Further, we do not claim that we sampled all the off-licensed premises in Wellington. We did not assess frequency of alcohol consumption or of the related behaviours, which precludes the ability to determine if a respondent's experience was typical for him or her or if the evening was more of an anomaly. However, the research method and sampling approach likely resulted in a sample that is representative of a typical Wellington weekend evening in winter. For example, measures were taken to ensure that no major events were happening in the city that would yield a sample that was different from who would normally be purchasing on those days and times or of their alcohol-related behaviours.

It is important to note that the occurrence of harms in this study should not solely be attributed to the off-licence purchases. The majority of the sample went out after the purchase, and many of the reported destinations potentially sold alcohol (eg, bars, restaurants, etc). Furthermore, respondents who went home for the remainder of the evening had a prevalence of experiencing no harms that was double (60.8%) the prevalence of those who went out (30.0%). This finding could be further explored in future research that looked at the relationship between alcohol consumption at Wellington on-licences and the experience of ARH.

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