

The burden of alcohol-related presentations to a busy urban New Zealand hospital emergency department

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ABSTRACT

AIMS: This cross-sectional observational study presents a focused analysis of alcohol-related presentations (ARPs) to a major New Zealand emergency department (ED) with the aim of describing and comparing the profile and outcomes of these presentations.

METHODS: A secondary analysis of 12 months (November 2017 to October 2018) of electronic patient records of adult (≥ 15 years) presentations to the Auckland City Hospital Adult ED. The primary area of interest was patient's alcohol-related status. Additional information reviewed included: patient demographics, and features of the presentation such as time of presentation, triage category and discharge disposition.

RESULTS: Among 73,381 presentations, 7% ($n=5,130$) were alcohol-related, the majority were male (65%) and aged 20–39 (52%). ARPs were more frequent at night, during the weekends, public holidays and over the summer months. Sixteen percent of injury-related presentations were alcohol-related. ARPs commonly arrived at the ED via emergency services and had a longer length of stay than non-ARPs.

CONCLUSIONS: The findings from this study highlight the burden of alcohol misuse on the ED. Continued public health efforts are required to implement preventative strategies for alcohol-related harm in the ED and society as a whole.

The consumption and harmful use of alcohol is associated with significant global health burden, resulting in physical, psychological and social impacts. The harmful use of alcohol is estimated to cause 5.3% of all deaths globally, and account for 5.1% of all Disability Adjusted Life Years.¹ In New Zealand, mortality and morbidity rates associated with alcohol differ by sex and ethnicity. There are twice as many alcohol-related deaths in men than women. The age-standardised alcohol-related mortality rate for Māori (New Zealand's indigenous population) is two and a half times that of their non-Māori counterparts.²

The most recent Ministry of Health (MoH) National Health Survey (2017) found 20% of adults engage in 'hazardous drinking'.³

Hospital emergency departments (EDs) often bear the brunt of alcohol-related harm.^{3,4} According to a 2017 survey of Australasian EDs, at peak times, at least 12% of New Zealand ED presentations are there as a result of harmful alcohol use.⁵ Alcohol-related presentations (ARPs) commonly occur in the weekends and are more likely to be late at night or in the early hours of the morning, typically presenting as injuries which are often serious and potentially life threatening.⁶

Alcohol is the most commonly reported factor involved in aggression experienced in the ED.^{4,7} A 2014 survey of Australasian ED staff found that 98% of staff in Australia and 92% in New Zealand reported experiencing alcohol-related verbal and physical

aggression in the workplace, with 68% experiencing verbal aggression at least once a week.⁴ ED patients with ARPs pose a risk to their own health, but also divert time and resources from other patients.^{4,8}

In order to effectively target prevention strategies to reduce ARPs and their deleterious consequences, evidence regarding the characteristics of those who present to the ED with an ARP is required. Since November 2017, in response to the MOH's guidelines (National Non-admitted Patient Collection), Auckland Hospital has been collecting information on the number of ARPs to the ED. The aim of this study is to describe and compare the profile and outcomes of those who present to ED with an ARP to those who present with a non-ARP.

Methods

This cross-sectional observational study used a descriptive analytical approach to examine routinely collected anonymised data of adult (≥ 15 years old) presentations to the Auckland Hospital Adult ED from 1 November 2017 to 31 October 2018. Auckland District Health Board serves a population of over 500,000 people. The adult (>15 years) ED is a busy urban ED and sees approximately 70,000 adult presentations per annum.

In response to the MOH's mandate to complete an 'alcohol involved field' on all patients, all Auckland Hospital ED clinical staff are required to determine "is alcohol associated with this presentation?". This can be filled out by any member of staff including triage nurses, patients' nurses, charge nurses or doctors. It is a mandatory field in the patient management system and the visit can not be completed until the question is completed. There are four available alcohol consumption response options recorded:

- Yes: associated with this presentation
- Secondary: a consequence of others' consumption
- No: not directly associated with the presentation
- Unknown: not known or could not be determined

In determining whether alcohol is associated with a presentation, both acute and usual use of alcohol are considered. For the

purposes of this analysis, the reason for presentation was classified as one of the four categories used by Egerton-Warburton et al: injuries, mental health, intoxication and multiple medical conditions.⁸ An ARP was defined as per the criteria used by Egerton-Warburton et al, staff received training on the use of these categories. Staff were directed to ask about alcohol involvement if patients presented with an injury or overdose, if staff did not ask about alcohol ingestion then they were directed to record the response as 'unknown'. To remind staff to ask about alcohol-related presentations it was incorporated into the nursing assessment pro forma. For all other presentations, staff used their judgement regarding alcohol involvement.

In addition to the alcohol field, the variables of interest included: patient demographics (age, gender description, domicile description and code, New Zealand deprivation index—an area level measure, ethnicity and New Zealand residency status), temporal features of the presentation (date, time, day of week, season and public holiday), and presentation characteristics (presentation type, arrival mode, triage category code, discharge type and ED length of stay). The alcohol question response variable was classified into three categories: alcohol-related (Yes or Secondary), not alcohol-related and unknown.

Descriptive statistics were used to summarise the data. Ethics approval for the study was obtained from the University of Auckland Human Participants Ethics Committee (Reference 022208) and institutional approval from the Auckland District Health Board (Reference A+8299). All data was de-identified and stored in password-protected files.

Results

During the 12-month period reviewed, there were 73,381 presentations to the Auckland Hospital ED. The overall study population was 51% male and 54% were of New Zealand European or 'Other' ethnicity. Among the 73,381 presentations in the study period, the alcohol-related status was recorded as 'not known' in 5% ($n=3,387$). In these cases, either the alcohol status was unable to be ascertained by staff ($n=2,313$) or the information was missing ($n=1,074$).

Table 1: Distribution of the demographics of Auckland Hospital Emergency Department presentations by alcohol status (column percentages).

Variables	Total n (%)	Alcohol-related n (%)	Not alcohol-related n (%)	Not known n (%)
Total presentations	73,381 (100%)	5,130 (7.0%)	64,864 (88.4%)	3,387 (4.6%)
Gender*				
Female	35,698 (48.3%)	1,787 (34.8%)	34,383 (53.0%)	1,512 (44.6%)
Male	37,682 (51.4%)	3,343 (65.2%)	30,280 (47.0%)	1,875 (55.4%)
Age (in years)				
15–19	4,871 (6.6%)	605 (11.8%)	3,991 (6.2%)	275 (8.1%)
20–29	16,197 (22.1%)	1,731 (33.7%)	13,502 (20.8%)	964 (28.5%)
30–39	11,849 (16.2%)	903 (17.6%)	10,227 (15.8%)	719 (21.2%)
40–49	8,867 (12.1%)	739 (14.4%)	7,679 (11.8%)	449 (13.3%)
50–59	9,186 (12.5%)	564 (11.0%)	8,206 (12.7%)	416 (12.3%)
60–69	8,149 (11.1%)	316 (6.2%)	7,581 (11.7%)	252 (7.4%)
70–79	6,997 (9.5%)	182 (3.6%)	6,642 (10.2%)	173 (5.1%)
80–89	5,399 (7.4%)	71 (1.4%)	5,211 (8.0%)	117 (3.5%)
90+	1,866 (2.5%)	19 (0.4%)	1,825 (2.8%)	22 (0.7%)
Ethnicity				
Māori	7,905 (10.8%)	860 (16.8%)	6,465 (10.0%)	580 (17.2%)
NZE other**	39,614 (54.0%)	3,141 (61.2%)	34,689 (53.5%)	1,784 (52.7%)
Asian	15,614 (21.3%)	585 (11.4%)	14,363 (22.1)	666 (19.7%)
Pacific peoples	10,248 (14.0%)	544 (10.6%)	9,347 (14.4%)	357 (10.5%)
NZDep2013 index of deprivation				
1–2 least deprived	11,636 (15.9%)	772 (15.1%)	10,446 (16.1%)	418 (12.3%)
3–4	14,505 (19.8%)	889 (17.3%)	13,053 (20.1%)	563 (16.6%)
5–6	15,765 (21.5%)	1,173 (22.9%)	13,963 (21.5%)	629 (18.6%)
7–8	10,712 (14.6%)	729 (14.2%)	9,519 (14.7%)	464 (13.7%)
9–10 most deprived	18,696 (25.48%)	1,450 (28.3%)	16,053 (24.8%)	1,193 (35.2%)
New Zealand residency				
No	9,111 (12.4%)	630 (12.3%)	7,769 (12.0%)	712 (21.0%)
Yes	64,270 (87.6%)	4,500 (87.7%)	57,095 (88.0%)	2,675 (79.0%)

* One record missing = gender unspecified.

** NZE other = European, Middle Eastern/Latin American/African, other ethnic groups and ethnicities.

Seven percent of all presentations were alcohol-related, and 65% of these were male. Among all ARPs, the majority were aged 20–29 years old (34%) followed by those aged 30–39 years (18%) (Table 1). The highest proportion of ARPs among all presentations were found in those aged 15–19 years. This group covered a five-year age range but accounted for 12.4% of ARPs compared with 7% overall. Māori were

over represented, accounting for 17% of ARPs but only 8% of the Auckland DHB population.⁹ NZDep2013, an area level deprivation measure, was used to analyse the socioeconomic deprivation status of ARPs.¹⁰ Twenty-eight percent of ARPs were in the most deprived (9–10) groups compared with only 25% of non-ARPs. There was no difference in the prevalence of ARPs by New Zealand residency status.

Table 2: Distribution of the timing of Auckland Hospital Emergency Department presentations by alcohol status (column percentages).

Variables	Total n (%)	Alcohol-related n (%)	Not alcohol-related n (%)	Not known n (%)
Total presentations	73,381 (100%)	5,130 (7.0%)	64,864 (88.4%)	3,387 (4.6%)
Time of day				
Day (0700–1459)	28,446 (38.8%)	906 (17.7%)	26,182 (40.4%)	1,358 (40.1%)
Evening (1500–2259)	30,860 (42.1%)	1,717 (33.5%)	27,787 (42.8%)	1,356 (20.0%)
Night (2300–0659)	14,075 (19.2%)	2,507 (48.9%)	10,895 (16.8%)	673 (19.9%)
Weekend or weekday				
Monday–Thursday	51,232 (69.8%)	2,692 (52.5%)	46,150 (71.1%)	2,390 (70.6%)
Friday–Sunday	22,149 (30.2%)	2,438 (47.5%)	18,714 (28.9%)	997 (29.4%)
Public holiday				
No	70,958 (96.7%)	4,914 (95.8%)	62,773 (96.8%)	3,271 (96.6%)
Yes	2,423 (3.3%)	216 (4.2%)	2,091 (3.2%)	116 (3.4%)
ANZAC day	221 (0.3%)	15 (0.3%)	200 (0.3%)	6 (0.2%)
Auckland Anniversary	229 (0.3%)	19 (0.4%)	200 (0.3%)	10 (0.3%)
Boxing Day	196 (0.3%)	24 (0.5%)	170 (0.3%)	2 (0.1%)
Christmas Day	238 (0.3%)	20 (0.4%)	210 (0.3%)	8 (0.2%)
Easter Monday	200 (0.3%)	10 (0.2%)	187 (0.3%)	3 (0.1%)
Good Friday	183 (0.3%)	20 (0.4%)	154 (0.2%)	9 (0.3%)
Labour Day	230 (0.3%)	22 (0.4%)	196 (0.3%)	12 (0.4%)
New Year's Day	270 (0.4%)	48 (0.9%)	208 (0.3%)	14 (0.4%)
2 nd January	230 (0.3%)	16 (0.3%)	187 (0.3%)	27 (0.8%)
Queen's Birthday	209 (0.3%)	12 (0.2%)	183 (0.3%)	14 (0.4%)
Waitangi Day	217 (0.3%)	10 (0.2%)	196 (0.3%)	11 (0.3%)
Season				
Spring	18,091 (24.7%)	1,188 (23.2%)	15,993 (24.7%)	910 (26.9%)
Summer	18,493 (25.2%)	1,510 (29.4%)	16,182 (25.0%)	801 (23.7%)
Autumn	18,379 (25.1%)	1,253 (24.4%)	16,274 (25.1%)	852 (25.2%)
Winter	18,418 (25.1%)	1,179 (23.0%)	16,415 (25.3%)	824 (24.3%)

Table 3: Distribution of the characteristics of Auckland Hospital Emergency Department presentations by alcohol status (column percentages).

Variables	Total n (%)	Alcohol-related n (%)	Not alcohol-related n (%)	Not known n (%)
Total presentations	73,381 (100%)	5,130 (7.0%)	64,864 (88.4%)	3,387 (4.6%)
Injury related presentation				
Yes	20,188 (27.5%)	3,308 (64.5%)	16,060 (24.7%)	820 (24.2%)
Female	9,223 (12.6%)	1,153 (22.5%)	7,717 (11.9%)	353 (10.4%)
Male	10,965 (14.9%)	2,155 (42.0%)	8,343 (12.9%)	467 (13.8%)
Arrival mode to the emergency department				
Aeroplane or helicopter	435 (0.6%)	45 (0.9%)	351 (0.5%)	39 (1.2%)
Ambulance	20,716 (28.2%)	2,518 (49.1%)	17,226 (26.6%)	972 (28.7%)
Own transport	51,151 (69.7%)	2,405 (46.9%)	46,497 (71.7%)	2249 (66.4%)
Police	567 (0.8%)	157 (3.1%)	301 (0.5%)	109 (3.2%)
Unknown	512 (0.7%)	5 (0.1%)	489 (0.7%)	18 (0.5%)
Triage category				
1 (life threatening)	2,951 (4.0%)	426 (8.3%)	2,119 (3.3%)	406 (12.0%)
2	13,753 (18.7%)	678 (13.2%)	12,761 (19.7%)	314 (9.3%)
3	28,195 (38.4%)	2,010 (39.2%)	25,160 (38.8%)	1,025 (30.3%)
4	26,883 (36.6%)	1,944 (37.9%)	23,526 (36.3%)	1,413 (41.7%)
5 (least urgent)	1,573 (2.1%)	72 (1.4%)	1,291 (2.0%)	210 (6.2%)

During the day (7am–2.59pm), ARPs accounted for 3% of all presentations compared to 6% during the evening (3pm–10.59pm) and 18% at night (11pm–6.59am) (Table 2). ARPs accounted for 5% of weekday presentations (Monday to Thursday) compared to 11% of presentations on the weekend (Friday to Sunday). ARPs were more common on public holidays, with New Year's Day having the greatest proportion of ARPs (18% of all the public holidays, followed by Boxing Day (12%), compared to 7% of all presentations being alcohol-related in the study period. ARPs were more likely to occur (29%) over the summer months (December, January, February) compared to other seasons.

More than one in seven injury-related presentations (n=3,308) during the study period were alcohol-related, accounting for 65% of all ARPs (Table 3). Alcohol-related injury presentations (ARIPs) were more commonly males (20% of all injury

presentations cf. 13% for females). Half (53%) of ARPs arrived at the ED via emergency services, compared with only 28% of non-ARPs. Eight percent of ARPs were classified as having life-threatening conditions (Australasian Triage Scale [ATS] 1) compared with only 3% of non-ARPs.

Using the total length of stay recorded for individuals from presentation to the ED until either admission to the hospital or discharge, we determined the median and interquartile range for both ARPs and non-ARPs. ARPs had a median ED length of stay of five hours (interquartile range [IQR] 3h10m–7h19m) compared to a median stay of 2 hours and 58 minutes (IQR 2h42m–5h40) for non-ARPs. The majority of both ARPs and non-ARPs were discharged home from the ED, however, ARPs were more likely to self-discharge (6% cf. 2%), leave the ED prior to treatment (5% cf. 2%) and be forcibly removed (0.1% cf. 0.01%) compared with non-ARPs (Table 4).

Table 4: Distribution of discharge type descriptions of Auckland Hospital Emergency Department presentations by alcohol status (column percentages).

Variables	Total n (%)	Alcohol-related n (%)	Not alcohol-related n (%)	Not known n (%)
Total presentations	73,381 (100%)	5,130 (7.0%)	64,864 (88.4%)	3,387 (4.6%)
Discharge type				
Home	43,100 (58.7%)	4,047 (78.9%)	36,701 (56.6%)	2,352 (69.4%)
Routine discharge from ED	38,510 (52.5%)	3,453 (67.3%)	34,027 (52.5%)	1,029 (30.4%)
Self-discharge from ED	1,834 (2.5%)	321 (5.7%)	1,366 (2.1%)	147 (4.34)
Forcibly removed	23 (0.03%)	7 (0.1%)	4 (0.01%)	12 (0.4%)
Patient did not wait	2,733 (3.7%)	205 (5.2%)	1,304 (2.0%)	1,164 (34.4%)
Admitted	28,806 (39.3%)	1,020 (19.9%)	26,914 (41.5%)	872 (25.8%)
Transfer to another healthcare facility	650 (0.9%)	51 (1.0%)	507 (0.8%)	92 (2.7%)
Deceased*	791 (1.1%)	11 (0.2%)	714 (1.1%)	66 (2.0%)
Unknown	34 (0.1%)	1 (0.02%)	28 (0.04%)	5 (0.2%)

* Death could have occurred in ED or as an inpatient.

Discussion

This observational study has quantified the prevalence of ARPs to the Auckland ED and described the profile and outcomes of these presentations compared to those with non-ARPs. The findings have provided important insight into the role alcohol plays in a large urban New Zealand ED. Over the 12-month period reviewed, alcohol played a role in 7% of presentations, equating to 5,130 patients. Strengths of the study include its size, over 73,000 patients, the completeness of data relating to the role alcohol played in the admission, and the 12-month data review period which enabled analysis of temporal factors.

It is likely that the 7% prevalence of ARPs among all presentations to the ED found in the current study is an underestimate. This finding is at the lower end of the range of previous study findings on the role of alcohol in the ED, which identified alcohol involvement in between 5–20% of all ED presentations.^{11,12} In the 2013 study performed on a Saturday in December across multiple Australasian EDs, Egerton Warburton et al found up to 14% of presentations were alcohol-related.⁸ However, their

study index time was 0200 in the morning when there is more likely to be ARPs. Similarly, the study by Indig et al evaluating staff attitudes and perceptions of the impact of alcohol in the ED, attributed up to 18% of weekday ED presentations as alcohol-related.¹³ The comparatively lower prevalence found for ARPs at Auckland ED may in part reflect the 12-month duration of this study, which is longer than many of the studies reviewed, demonstrating variations in the prevalence of ARPs at certain times of the year. The exception to this is the study by Indig et al, which looked at the prevalence of alcohol or drug (AOD) presentations to Australian EDs over a 24-month period, and found that 5% of presentations were alcohol related, similar to our findings.¹¹ While the study period and time of data collection were factors that could influence the number of presentations recorded as alcohol-related, the likely exclusion of presentations that are not immediately related to alcohol consumption (coded as 'secondary' alcohol use) such as those of chronic alcohol use and related problems could further explain the lower than expected prevalence.

Sixteen percent of injury-related presentations in the present study were alcohol-related, lower than the 21% found in the 2018 study of alcohol and injury among attendees to the Auckland ED by Kool et al.¹⁴ However, the Kool et al study assessed alcohol consumption using an interviewer-administered World Health Organization Emergency Room Collaboration Analysis Project (WHO/ERCAAP) questionnaire, in which breath alcohol and patient self-report were used to assess alcohol consumption. This comprehensive approach is likely to more accurately represent the burden of alcohol in the ED in the context of injury-related presentations. The use of a screening tool such as the Alcohol Use Disorders Test (AUDIT) in the ED and or blood/breath alcohol would increase the precision of our estimates.¹⁵ However, the present study made use of data collected as part of the recently mandated MOH 'alcohol involved field'. Future studies could look to validate the information collected in this manner with a validated tool such as the AUDIT.

Males comprised almost two-thirds of ARPs to the ED in this study. This is consistent with findings from Whitlam et al's study of 1,000 ARPs to New South Wales (NSW) EDs in Australia that identified 64% of these presentations as male.¹⁶ This skewed distribution of gender among ARPs is confirmed in the published literature, as are trends in age of presentations to the ED.^{11,17-19} In accordance with our data showing the highest proportion of ARPs found in young adults (<29 years), both Stewart et al¹⁹ and Muscatello et al²⁰ found that patients with ARPs were commonly aged between 16 and 25 years. However, the surveillance study by Muscatello et al looking at all acute ARPs from NSW EDs identified that while the highest rates of ARPs were among males and young adults, in the 10-17 year-old age group, females represented a higher proportion of ARPs compared to their male counterparts. Māori were over represented among ARPs in the current study, accounting for 17% of ARPs while only representing 8% of the Auckland DHB population.⁹ The 2018 study by Kool et al looking at acute alcohol involvement in injury-related presentations (those who had consumed alcohol within six hours of presentation) to the Auckland ED demonstrates similar findings, with Māori

accounting for 15% of all ARIPs, a higher proportion than that found for Pacific, Asian or NZE/Other ethnicities.¹⁴ Our findings highlighted some discrepancies between ARPs and socioeconomic status, with a higher proportion of those in more deprived areas (NZDep 9-10) found for ARPs compared to non-ARPs. No studies were located in the published literature that had reported on ARPs by socioeconomic deprivation.

ARPs to the ED showed temporal patterns in our data that are supported in the published literature, confirming that ARPs are more common late at night,^{6,12,16,19,21,22} in the weekends^{6,12,19} and during the summer months,²³ likely to reflect the drinking culture of the community. The study by McLay et al found that over one week in December 2014, up to 33% of ED presentations between 12am and 4am were alcohol related.²² Similarly, Hides et al found in a study of young adults presenting to the ED with an injury that the majority of ARIPs occurred between 10pm and 5am and more than half presented on the weekends.²⁴ The retrospective surveillance study in rural coastal towns of Australia by Coomber et al highlights the seasonal trends in alcohol consumption and consequential ARIPs to the ED, where the prevalence of these increased over the summer months of the year compared to others, particularly for males.²³

Previous research confirms our findings in relation to the distribution of triage category and arrival methods for ARPs, where the majority of presentations were triaged into a more urgent category and arrived by EMS to the ED. For example, both McLay et al²² and Egerton-Warburton et al¹⁸ found that the majority (57-59%) of ARPs were assigned a more serious triage category, classed on the Australasian Triage Scale as categories 1-3. In addition, across two surveillance studies by Indig et al it was reported that ARPs were more likely to arrive by ambulance to the ED and require police or hospital security staff involvement upon presentation in comparison to non-ARPs.^{12,25}

In the present study, almost two-thirds of ARPs were injury-related. We did not have data regarding the specific type of injury mechanism. The prospective study by McLay et al describing the profile of ARPs to a Perth ED found that individuals with ARPs were more likely than non-ARPs to have an

injury or mental health diagnosis.²² Further literature supports injury-related diagnoses as the most common among ARPs.^{18,25} While ARIPs make up a significant portion of the alcohol-related harm in the ED, future research should be inclusive of all ARPs in the context of both acute and usual alcohol use to ensure that the full extent of the role alcohol plays in the ED is captured.

The negative impacts of ARPs on patients' own health outcomes as well as that of other patients in the ED are well documented.^{4,18} The current study found that ARPs to the Auckland ED had longer length of stays than non-ARPs. Moreover, ARPs were more likely to be forcibly removed, self-discharge or leave prior to treatment compared to non-ARPs. Further analysis into how these presentations impact the ED is provided in the study by Butler et al that looks at the effects of drug and alcohol use among patients in a hospital ED.¹⁷ These individuals were more likely to cost more per presentation and stay longer if admitted.

The present study was not designed to evaluate the impact ARPs have on the ED with regards to clinicians' working environment and the effect of these presentations on other patients, both significant areas when assessing the role alcohol plays in the department. A survey of Wellington hospital ED staff by Gunasekara et al in 2011 reported that ARPs negatively impacted the ED in a multitude of areas, from increasing the workload and waiting times to negatively affecting the staff mood and care of other patients.²⁶ Furthermore, up to 85% of respondents in the study felt that no suitable measures were in place in the ED to handle ARPs and their impact on the ED. A survey completed by ED clinicians across Australasia found that 98% and 92% of respondents had experienced verbal and aggression respectively from an alcohol-affected patient in the last year.⁴ ARPs divert resources away from other patients and add strain to the ED, diminishing job satisfaction for ED staff and affecting the quality of care for all.^{4,7,13,26,27}

The study findings should be considered in light of some limitations. We have no available information regarding the reliability of our data in relation to the role alcohol played in the admission. As data

collection on ARPs had recently been introduced into the ED prior to our study, the definition of an ARP was developed prior to implementation, however this was a new concept for staff and may not have been utilised rigorously. While there were guidelines in place to aid the clinician, informed judgements were made which may have introduced measurement error. Ascertainment bias may have also occurred for patients who appeared intoxicated and were assumed to have an ARP rather than other drugs being primarily involved in their presentation. The alcohol-related question encompasses 'secondary' alcohol involvement, which may not have been elicited by the ED team therefore result in an underestimate of the secondary involvement of alcohol in ED presentations. This study is not population-based as Auckland Hospital is one of the three major admitting public hospitals in the Auckland region, which may limit generalisability of the findings. However, in light of the similar drinking culture across New Zealand and Australia, this study may have some external validity when looking at the impact alcohol has on EDs in general.

We were unable to identify any relationship between reasons for presenting to the ED and alcohol involvement in our study. The 'presenting complaint' free text field in our data was completed by ED triage nurses and describes the reason for a patient's presentation to the ED. However, due to the widely varying codes and descriptions used for this field, we were unable to identify any consistent trends using this data. Injuries are more clearly identified at triage and did allow analysis of ARIPs.

The present study highlights the burden of alcohol misuse on the ED. There is some evidence that the implementation of alcohol screening and brief intervention (SBI) programmes in the ED setting may be effective in reducing the harmful use of alcohol and other drugs.²⁸ A 2017 systematic review assessing the effectiveness of SBI in the ED setting found variable evidence where almost half of the studies failed to show an intervention effect for the outcome of alcohol consumption reduction, however there may be subgroups that have improved outcomes.²⁹ A recent study by Patson et al looking at the feasibility of SBI in the ED

found that this technique provided potential benefits for the patients with ARPs, their families and their nurses, however application of the SBI may create potential challenges for the ED with regards to an already immense staff workload and high patient to clinician ratio.³⁰

Our findings and those of similarly published studies emphasise the need for continued public health efforts to implement preventative strategies for alcohol-related harm in the ED and society as a whole. Raising awareness of the harms associated with alcohol through media and targeted programmes, along with evidence-based alcohol policies are among some of the most effective preventative approaches.^{8,31} Marketing restrictions, regulating the availability of alcohol, and modifying the drinking context using community-based solutions also offer the opportunity to reduce alcohol-related harm, and in doing so relieve

the burden of alcohol in the healthcare sector.³¹ A study by Connor et al examining alcohol outlet density in New Zealand found the density of outlets is associated with increased binge drinking and alcohol-related harm.³² These findings reinforce the need for local area alcohol policies to address the concentration of bars and off-licences in New Zealand. In 2012, the Sale and Supply of Alcohol Act (SAAA) was introduced which had as its key objective the minimisation of harm from excessive or inappropriate consumption of alcohol. However, a study by Randerson et al investigating perceived changes in the alcohol environment before and after the implementation of the SAAA found the Act's introduction had little impact on the alcohol environment during the period reviewed (2013–15).³³ The findings of the present study confirm the need for continued efforts to develop effective national policy to reduce the harms associated with harmful alcohol use.

Competing interests:

Nil.

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