

Alcohol-related Emergency Department presentations to Dunedin Hospital between 01/01/2018 and 31/12/2022

Te Waipounamu, Southern District

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Purpose: Update of a yearly report

Data: Southern District Patient Information System extract

Limitations: Issues with data recording quality and quality deterioration does not permit direct comparisons of visit counts from year to year and between hospitals.

Introduction

This report is based on the dataset recording presentations to Emergency Department of Dunedin Public Hospital from 2018 to 2022 (extracted in June 2024). Dunedin has an overall resident population of ~ 153 000, including ~ 21 000 students, with a total yearly ED visits of ~ 45 000. Whether a presentation is related to alcohol consumption or not is recorded in a flag variable, required by the Ministry of Health, which captures the following grades:

- Yes - alcohol consumption is directly associated with this presentation,
- Secondary - consequence of others' alcohol consumption,
- No - alcohol consumption is NOT directly associated with this presentation,
- Not known - couldn't determine if alcohol is associated with this presentation.

Although the alcohol variable is mandatory, there are issues with data recording quality (see last section). From 01-01-2021 to 10-01-2021 no visits were marked as related to alcohol due to software issue, resulting in a loss of estimated 42 visits. Given these problems with data quality, missing records and those recorded as unrelated to alcohol are combined in a single category. A data gap in early 2021 is treated individually in each table.

Alcohol-related presentations are compared to unrelated ones along the following dimensions:

- Absolute visit counts and visit periodicity (day of the week and hour of the day),
- Basic demographic traits of presenters (age and gender),
- Basic clinical characteristic of the visits (mode of arrival, triage and admission rates).

Periodicity and number of ED visits

The average daily number of directly alcohol-related presentations decreased from 4.2 (SD \pm 3.9) in 2018 to 3.0 (SD \pm 2.9) in 2022 and indirectly related presentations from 0.6 (SD \pm 0.9) in 2018 to 0.3 (SD \pm 0.5). Although there appears to be a positive trend, i.e., a reduction in alcohol-related presentations, the difference is not statistically significant. It is also possible that apparent trends are influenced by administrative factors, such as a change over time in the quality of the recording of the alcohol flag.

Table 1: Total ED presentation counts by alcohol classification (Dunedin Hospital)

	2018	2019	2020	2021*	2021**	2022
Yes, directly related	1520 (3.3%)	1626 (3.4%)	1417 (3.3%)	1369 (3.0%)	1406 (3%)	1090 (2.4%)
Yes, indirectly related	219 (0.5%)	225 (0.5%)	263 (0.6%)	151 (0.3%)	156 (0.3%)	98 (0.2%)
Unrelated or unknown	44158 (96%)	45644 (96%)	40684 (96%)	43295 (97%)	43253 (96%)	43999 (97%)
Total	45897	47495	42364	44815	44815	45187

* Visit counts with data gap in place; ** visit counts including expected numbers based on 4-year averages specific for each of the missing days.

Overall, ED visits are distributed evenly throughout the week. By contrast, alcohol-related presentations increase notably toward the weekend. Maximum visit count, which occurs on Sunday, is 2-3 times higher compared to working days. Hours between 8 PM and 4 AM on Sunday see the highest average number of alcohol-related visits.

Table 2: Average daily ED presentations through the week (2018 to 2022)

	Monday (\pm SD)	Tuesday (\pm SD)	Wednesday (\pm SD)	Thursday (\pm SD)	Friday (\pm SD)	Saturday (\pm SD)	Sunday (\pm SD)
Alcohol-related	2.5 (\pm 1.9)	2.3 (\pm 2.1)	2.7 (\pm 2.3)	3.0 (\pm 2.4)	4.0 (\pm 3.1)	7.4 (\pm 4.9)	8.8 (\pm 4.5)
Unrelated or unknown	130 (\pm 16.4)	121 (\pm 15.8)	118 (\pm 15.6)	119 (\pm 15.0)	116 (\pm 14.8)	113 (\pm 15.4)	118 (\pm 15.2)

* Visit counts with data gap in place.

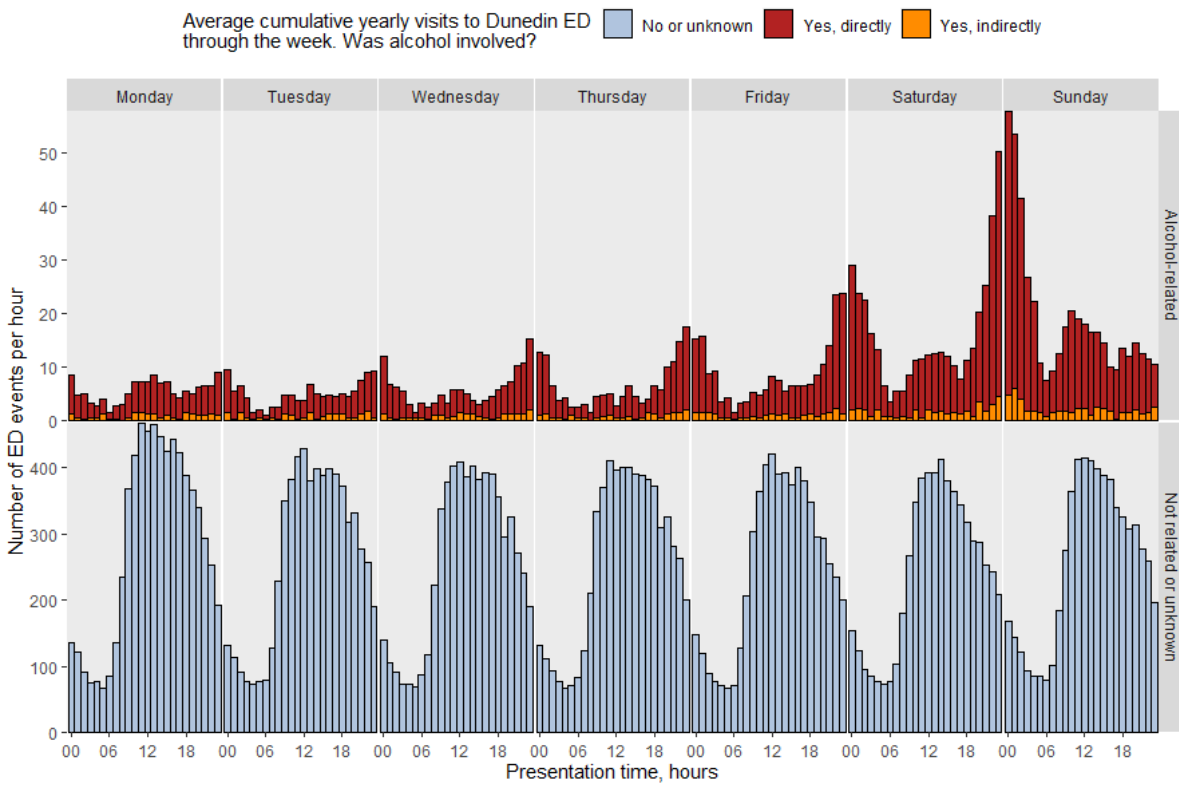


Figure 1. Distribution of yearly visits by time of the day and day of the week.

Demography of presentations: gender and age

Presenters aged 15 to 24 consistently have the highest numbers of alcohol-related ED visits and make up a higher proportion (9.2%) of all ED presentations compared to other age-groups. For adults aged 25 to 34, 35 to 44 and 45 to 54 years alcohol-related presentations also comprise a sizable proportion (>3.5%) of all ED presentations in each of the age groups.

With very few exceptions, males visit Dunedin Hospital ED with alcohol-related presentations more frequently than females regardless of the age group. Of note, the number of all ED presentations is slightly higher for females. Thus, average percentage of alcohol-related presentations out of all visits is higher for males (4.3%) compared to females (2.8%).

Table 3: Alcohol-related ED presentations by age group and gender

Age group	2018 F/M	2019 F/M	2020 F/M	2021* F/M	2022 F/M	Yearly average (% of all visits)
< 15	8/4	4/2	8/5	5/0	9/3	10 (0.2%)
15-24	417/557	460/565	369/485	387/485	274/343	869 (9.2%)
25-34	108/145	93/152	99/160	79/160	69/137	240 (4.2%)

35-44	52/109	83/114	77/131	45/67	59/58	159 (3.8%)
45-54	56/104	70/90	48/125	59/92	53/78	155 (3.6%)
55-64	44/39	36/78	32/58	29/42	17/40	83 (1.7%)
65-74	29/34	31/43	24/31	24/24	11/22	56 (1.2%)
75+	9/15	16/15	4/24	6/16	6/8	24 (0.4%)

Note: cases where gender is recorded as “other” or “unknown” are excluded from gender-specific counts, but not from yearly averages and percentages. * Visit counts with data gap in place.

Clinical characteristics

For alcohol-related presentations, ambulance and police were significantly more frequent modes of arrival to ED compared to visits unrelated to alcohol. Ambulance was involved 1.5 times more frequently in alcohol-related presentations. Walk-ins, by contrast, were much less frequent in this group (56% vs 71%).

Table 4: Mode of arrival for ED presentations: yearly average*.

Mode of arrival	Alcohol-related (directly and indirectly)	Unrelated to alcohol or unknown	Pairwise z-test p-value
Ambulance	589 (36.9%)	10783 (24.8%)	< 0.001
Police	71 (4.4%)	290 (0.7%)	< 0.001
Walk-in	891 (55.8%)	31031 (71.2%)	< 0.001
Other or unknown	45 (2.8%)	1451 (3.3%)	< 0.05

* Visit counts with data gap in place.

Presentations with the highest (resuscitation) and the lowest severity (semi- and non-urgent) grade were significantly more frequent among alcohol-related visits, whereas emergency and urgent presentations were less frequent.

Table 5: Severity for ED presentations: a yearly average and percentage*.

Severity of presentation	Alcohol-related	Unrelated or unknown	Pairwise z- test p-value
Resuscitation [immediately life threatening]	72 (4.5%)	555 (1.3%)	< 0.001
Emergency [imminently life-threatening, or important time-critical]	205 (12.8%)	6800 (15.6%)	< 0.001
Urgent	487 (30%)	16077 (36.9%)	< 0.001

[potentially life-threatening, or severe discomfort or distress]			
Semi-urgent [potentially serious, or significant complexity or severity, or discomfort or distress]	730 (45.8%)	17743 (40.7%)	< 0.001
Non-urgent or unknown	111 (6.9%)	2381 (5.5%)	< 0.001

* Visit counts with data gap in place.

The admission rate was consistently lower for alcohol-related ED presentations compared to ones unrelated to alcohol, with the 5-year average of 10 and 24% respectively.

Table 6: Admission rates of ED presentations (Dunedin Hospital) by year.

	2018	2019	2020	2021*	2022	Yearly average (% of all visits)
Alcohol-related	157 (9%)	186 (10%)	192 (11%)	167 (11%)	119 (10%)	164 (10%)
Not related or unknown	9463 (21%)	9938 (22%)	10160 (25%)	10882 (25%)	10859 (25%)	10260 (24%)

* Visit counts with data gap in place.

A technical note on data recording quality

Over the 5-year interval a total of 1205 ED visits were diagnosed with 100% alcohol-attributable conditions (ICD-10 codes F10.0, F10.2, F10.3, F10.4, F10.5, K29.2, K70.3, R78.0 and T51.0). Of those, 130 (11%) were not labelled as alcohol-related by Ministry of Health alcohol flag variable, suggesting undercounting of true alcohol-related presentations, with the undercount increasing progressively from year to year.