

Alcohol-related Emergency Department presentations to Southland Hospital between 01/01/2028 and 31/12/2022

Te Waipounamu, Southern District

09/10/2024

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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 Southland Public Hospital from 2018 to 2022 (extracted in June 2024). Invercargill has an overall resident population of ~ 68 000 with a total yearly ED visits of ~ 38 000. 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 27 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 1.6 (SD \pm 1.7) in 2018 to 1.1 (SD \pm 1.3) in 2022 and indirectly related stayed stable at 0.1 – 0.3 (SD \pm 0.4 – 0.6) in the same interval. 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

	2018	2019	2020	2021*	2021**	2022
Yes, directly related	588 (1.5%)	575 (1.5%)	534 (1.5%)	425 (1.1%)	448 (1.1%)	395 (1.1%)
Yes, indirectly related	91 (0.2%)	105 (0.3%)	66 (0.2%)	109 (0.3%)	113 (0.3%)	54 (0.2%)
Unrelated or unknown	37973 (98.2%)	38837 (98.3%)	35996 (98.4%)	38479 (98.6%)	38986 (98.6%)	36253 (98.8%)
Total	38652	39517	36596	39013	39013	36702

* 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	1.1 (\pm 1.2)	1.0 (\pm 1.2)	1.1 (\pm 1.2)	1.0 (\pm 1.1)	1.5 (\pm 1.4)	2.4 (\pm 1.7)	3.2 (\pm 2.1)
Unrelated or unknown	112 (\pm 15.2)	103 (\pm 14.1)	102 (\pm 13.2)	102 (\pm 13.3)	100 (\pm 12.5)	98 (\pm 13.1)	102 (\pm 13.4)

* Visit counts with data gap in place.

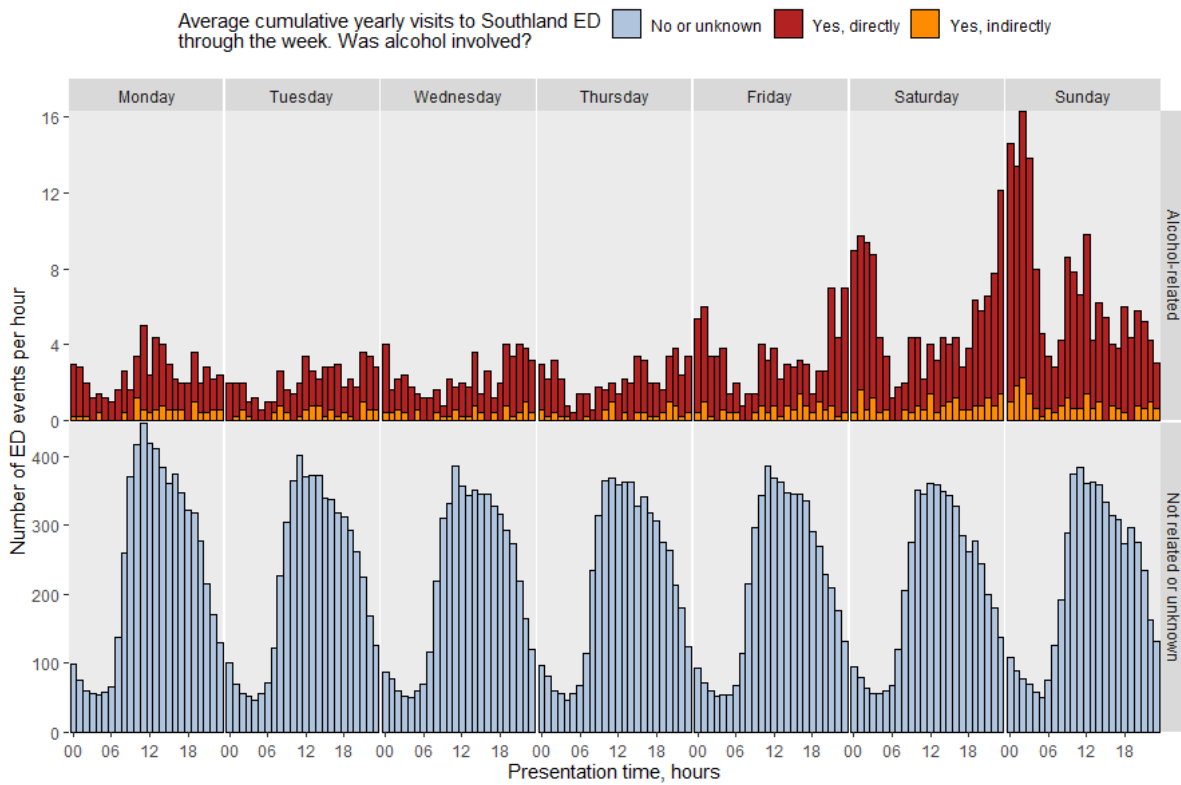


Figure 1. Distribution of yearly visits by time of the day and day of the week.

Demography of presentations: gender and age

Presenters aged 15 to 24 consistently have the highest alcohol-related ED visits and make up a highest proportion (3.7%) of all ED presentations compared to other age-groups. For adults aged 25 to 34 and 45 to 54 years, the fraction of alcohol-related presentations among all ED visits is also relatively high ($\geq 2\%$) in each of the age groups.

With very few exceptions, males visit Southland Hospital ED with alcohol-related presentations more frequently than females regardless of the age group, although magnitude of the difference is moderate. The number of all ED presentations is very similar between genders and the average percentage of alcohol-related presentations out of all visits is 1.9% for males compared to 1.2% for females.

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	3/3	3/1	5/6	3/1	2/1	6 (0.1%)
15-24	103/171	103/145	81/127	70/87	60/106	211 (3.7%)
25-34	51/91	48/86	61/88	48/74	28/68	129 (2.4%)

35-44	37/48	41/37	33/38	20/37	24/31	69 (1.7%)
45-54	34/50	55/44	25/39	29/50	24/33	77 (2.0%)
55-64	17/28	19/41	15/29	22/34	11/15	46 (1.2%)
65-74	5/18	9/26	7/23	10/21	11/19	30 (0.8%)
75+	3/17	5/17	6/17	6/22	3/12	22 (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 2 times more frequently and the police – 20 times more frequently in alcohol-related presentations. Walk-ins, by contrast, were much less frequent for this group (58% vs 82%).

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	236 (40%)	6674 (17.8%)	< 0.001
Police	12 (2%)	37 (0.1%)	< 0.001
Walk-in	341 (58%)	30753 (82%)	< 0.001
Other or unknown	-	44 (0.1%)	> 0.05

* Visit counts with data gap in place.

Presentations with the two highest severity grades (resuscitation and emergency) were significantly more frequent among alcohol-related visits, whereas the rest of triage grades were less frequent compared to visits unrelated to alcohol.

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]	17 (2.9%)	172 (0.5%)	< 0.001
Emergency [imminently life-threatening, or important time-critical]	112 (19%)	4241 (11.3%)	< 0.001

Urgent [potentially life-threatening, or severe discomfort or distress]	241 (40.9%)	16258 (43.3%)	< 0.01
Semi-urgent [potentially serious, or significant complexity or severity, or discomfort or distress]	203 (34.4%)	15368 (41%)	< 0.001
Non-urgent or unknown	17 (2.8%)	1469 (3.9%)	< 0.01

* Visit counts with data gap in place.

The admission rate is very similar in ED presentations related and unrelated to alcohol, with the 5-year average at 22 and 23% respectively. Note that in 2020 there was a notable reduction in admissions, possibly related to COVID-19 lockdowns.

Table 6: Admission rates of ED presentations by year.

	2018	2019	2020	2021*	2022	Yearly average (% of all visits)
Alcohol-related	222 (33%)	188 (28%)	79 (13%)	97 (18%)	72 (16%)	132 (22%)
Not related or unknown	11010 (29%)	10916 (28%)	6763 (19%)	7119 (18%)	7146 (20%)	8591 (23%)

* Visit counts with data gap in place.

A technical note on data recording quality

Over the 5-year interval a total of 422 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, 104 (25%) 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.