Queensland Injury Surveillance Unit

QISU collects and analyses data from emergency department injury presentations on behalf of Queensland Health. Participating hospitals represent urban, rural and remote areas of Queensland. QISU publications and data are available on request for research, prevention and education activities.

INJURY BULLETIN

No. 111 April 2011

Emergency Department Presentations due to Alcohol-Related Injury in Queensland

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Summary

* There is a clear association between alcohol consumption and injury, with Emergency services at the forefront of managing the majority of alcohol related incidents
* Current health systems do not identify or report alcohol related health service events in a systematic or standardised way
* This is particularly so for emergency department (ED) health service events, therefore current estimates of the contribution that alcohol makes to the state injury burden are likely to be very conservative
* QISU has a database of emergency department injury surveillance data that combines demographic and diagnostic data with information relating to the mechanism of the injury event
* Using a detailed search strategy, QISU has identified 9431 alcohol related injury presentations for patients >12 years of age during the 11.5 year period
* This number represents 3% of all injuries in the QISU database for that age group during the study period
* Based on the number of cases identified QISU estimates that there are a minimum of 4000 ED presentations due to alcohol related injury per year in Queensland
* Injuries in the 18 to 24 year age group account for 30% of all alcohol related ED injury presentations
* Injuries due to assault make up nearly 40% of all alcohol related ED presentations
* Whilst assault accounted for 58% of alcohol related injury presentations from licensed venues, injuries in licensed venues represented only 15% of all alcohol related injuries during the study period
* Injuries due self-harm accounted for 11% of alcohol related ED presentations overall, but comprised nearly 40% of all high acuity alcohol related ED injury presentations

Introduction

The issue of interpersonal violence associated with alcohol consumption has received considerable focus in the Queensland and Australian media over the last couple of years. This interest was precipitated by several widely reported "glassing" events, where young people were assaulted at a licensed venue and sustained facial lacerations from other patrons who were wielding a glass implement. This media attention bolstered community perception that alcohol associated violence linked to licensed premises was increasing, and in 2009, triggered a Queensland Parliamentary inquiry into alcohol related violence.[1] The referral given to the Committee focused the context of the inquiry on alcohol related violence in and around licensed premises. The parliamentary committee acknowledged that alcohol related violence is a complex issue, with incidents occurring in a range of settings (home, public spaces, entertainment areas, licensed venues) and influenced by a range of social factors (age, gender, illicit drug use, mental health, socio-economic status). The committee highlighted particular concerns regarding 'the lack of data on the incidence and causes of alcohol related violence' and the 'role of illicit drugs' as a factor in anti-social public behaviour including violence. They also painted a picture of a growing culture of determined drunkenness. The committee made 68 specific recommendations ranging from licensing, policy and policing strategies, to community development and early intervention strategies. Within those recommendations came a call for improved data capture of alcohol related events and an improved system for emergency services staff to report assaults by intoxicated patients.[2]

This bulletin describes Emergency Department (ED) presentations due to alcohol related injury in Queensland over the last 11.5 years using QISU data. This analysis includes alcohol related injury in all contexts and is not restricted to interpersonal violence, nor alcohol related injuries that occur in and around licensed venues. The challenges of identifying alcohol related injury within current health data systems in Queensland is discussed.

HOSPITALS								
• Clermont	• Moranbah	• Proserpine	• Queen Elizabeth II	• Logan	• Mackay Base	• Mount Isa		
• Mareeba	• Sarina	• Mackay Mater	• Dysart	• Innisfail	• Robina	• Royal Children's	• Mater Children's	
• Bundaberg	• Marybourgh	• Warwick	• Collinsville	• Yeppoon	• Gatton	• Tully	• Cherbourg	
• Princess Alexandra	• Mater Adult	• Mater Private	• Redland	• Hervey Bay	• Hughenden	• Richmond	• Atherton	

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Method

QISU data is collected at triage in participating emergency departments throughout Queensland from urban, rural and remote areas. The majority of this data is collected using one of two electronic data systems: Emergency Department Information System (EDIS) or Hospital Based Clinical Information System (HBCIS). This data captures the triage description, patient demographics, injury diagnosis and other coded information that describes the injury event. Smaller sites collect using a paper based reporting system. We estimate that the current QISU reporting method captures approximately one-fifth of adult emergency presentations in Queensland. The number and location of collecting sites has varied during the study period.

QISU data was analysed for the 11.5 year period from January 1999-June 2010, for cases aged 12 years and over. The database was initially searched using the text search terms 'alcohol', 'intoxicated' coupled with the code for alcohol as a Major Injury Factor (NDSIS v 2c code for alcohol -0903). This search identified 4230 cases (4120 cases identified using the 0903 code alone). These cases were reviewed to identify triage text search terms that could identify further alcohol related injury cases with reasonable specificity. Approximately 60 text search terms and 10 text search phrases describing alcohol consumption were identified that were specific for alcohol related injury. Specificity was verified by reading the triage text fields. Cases where the triage nurse recorded that the patient "denied alcohol" were excluded. This novel search strategy identified 9431 cases, increasing the case yield by a factor of 2.2.

Data was analysed in uneven age groups for comparison with earlier published work.[3] The age range of 12 to 24 years has previously been considered in papers discussing alcohol consumption in young adults.[4] The age group 12-17 (6 years) represents adolescents and young adults who are below the age limit for legal service of alcohol in a licensed venue. The next age group in this dataset is 18 to 24 years (7 years). Data is then examined in 5 yearly age groups from 25 years onwards, with the over 65 year olds considered as one group.

The injury event was further categorised using the triage text and coded information to identify the **type of alcohol related injury:**

(1) Alcohol related Assault: includes cases of interpersonal violence (physical/ sexual assault) associated with alcohol consumption.

(2) Alcohol poisoning/ intoxication: This included cases where the person presented to hospital solely due to adverse effects associated with alcohol consumption (vomiting, nausea, discomfort, headache, unconscious etc.).

(3) Intentional Self- Harm: This included cases where the main purpose of the visit to the emergency department was for treatment after a self-harm event associated with alcohol use.

(4) Road Traffic Crash (RTC): This included cases where the person was injured as a result of a road traffic crash (driver, passenger, cyclist, pedestrian) and alcohol was identified as a factor (ingested by the presenting person or another person involved in the RTC)

(5) Alcohol related Injury-other: includes all other cases where the person was injured as a result of alcohol consumption (personal consumption or that of a third party), unless included in the categories 1 to 4 above.

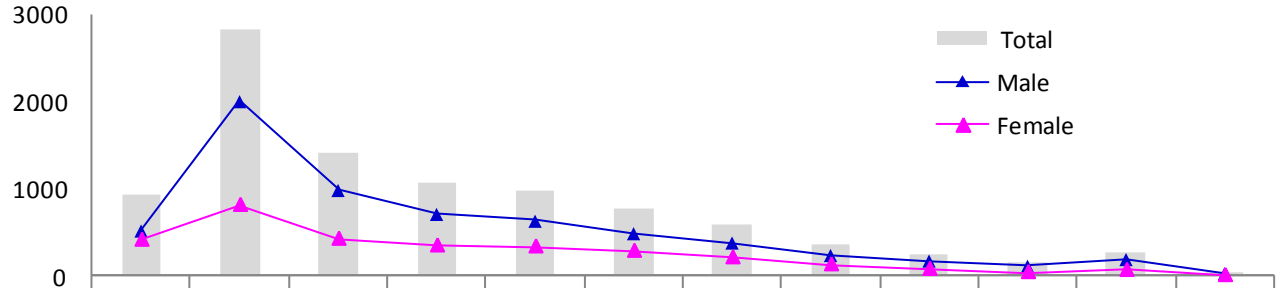
Allocation of type of alcohol related injury was based on triage text and coded information without further validation using chart review. Despite this detailed search and categorisation strategy, research suggests that this is still an underestimate of the number of alcohol related injuries. This will be discussed in greater detail.

Results

Gender & Age:

There were a total of 9341 injury presentations where alcohol involvement could be identified as having contributed to the injury presentation. (Of these, 4120 could be identified using the MIF code for alcohol). This represents 3% of all injury presentations in the QISU dataset for this age range over the 11.5 year period and an average of 812 presentations per year. Of these, 6322 (67%) were male and 3109 (33%) were female resulting in a Male: Female ratio of 2:1. As data collected from QISU collection sites represents approximately one fifth of the total number of ED presentations in this age group, QISU estimates that there are a minimum of 4000 alcohol related injury presentations to Queensland EDs per year.

Figure 1: Distribution by Age Group and Gender of alcohol related injuries: January 1999- June 2010: (n=9431)



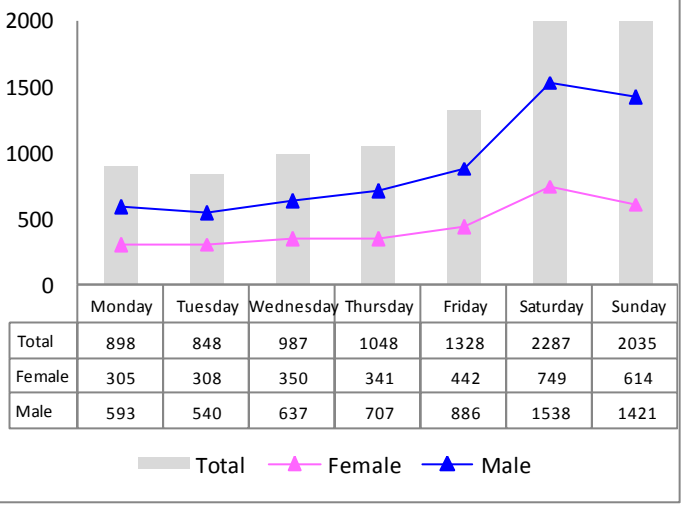
	12 - 17	18 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65+	Unknown
Total	915	2806	1394	1042	952	758	576	352	236	139	241	20
Male	507	2001	975	699	620	476	368	224	160	100	177	15
Female	408	805	419	343	332	282	208	128	76	39	64	5

The seven year age group spanning 18-24 years accounted for 30% of all alcohol related injury presentations (2806/9431) during the study period. Examining the 18 to 24 year age group more closely, the number of alcohol related injury presentations fell slightly with increasing age across the 7 year age gap. The male to female ratio for the 18-24 year age group (M:F) was 2.4:1. **Figure 1** shows the age group and gender distribution of alcohol related injury presentations.

Day and Time of presentation:

Figure 2 shows the variation in the number of presentations by day of the week. Nearly half (4322/9431 or 45%) of all alcohol related ED presentations occurred on the weekend days (Saturday and Sunday). People aged 18-24 years accounted for 36% (1542/4322) of weekend presentations, with males making up 72% (1107/1542) of that group. There was little variation in the number of alcohol related injury presentations by month with 55% of presentations (5178/9431) occurring between December and May.

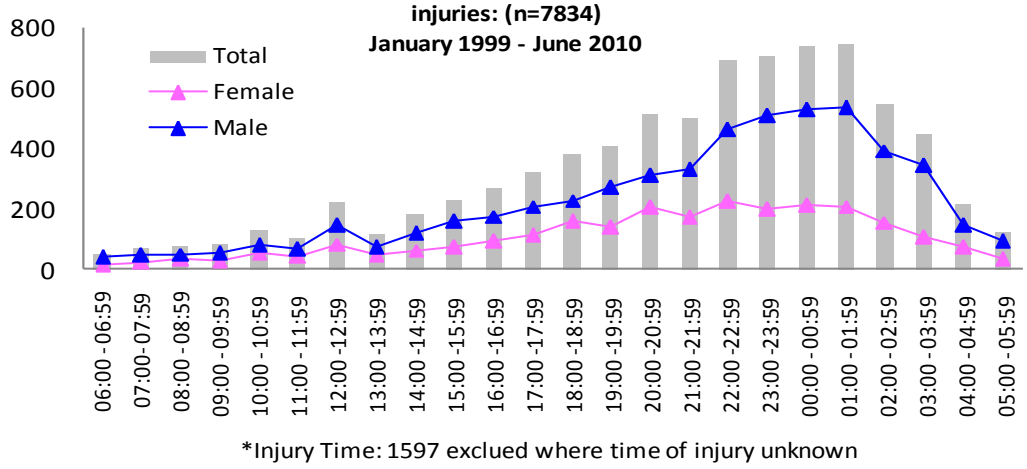
Figure 2: Distrbution of Attend Day and Gender of Alcohol related injuries January 1999- June 2010 (n=9431)



	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Total	898	848	987	1048	1328	2287	2035
Female	305	308	350	341	442	749	614
Male	593	540	637	707	886	1538	1421

There were 1597 cases where the time of injury was unknown. These unknown injury times default to 00:01 in the computer systems as they are a mandatory field. **Figure 3** represents the distribution of alcohol related injury by gender and time of injury for the remaining 7834 presentations. There was variation in the injury time for alcohol related injuries, with a peak between 01:00 and 01:59 (700/7834 or 9.4% of presentations).

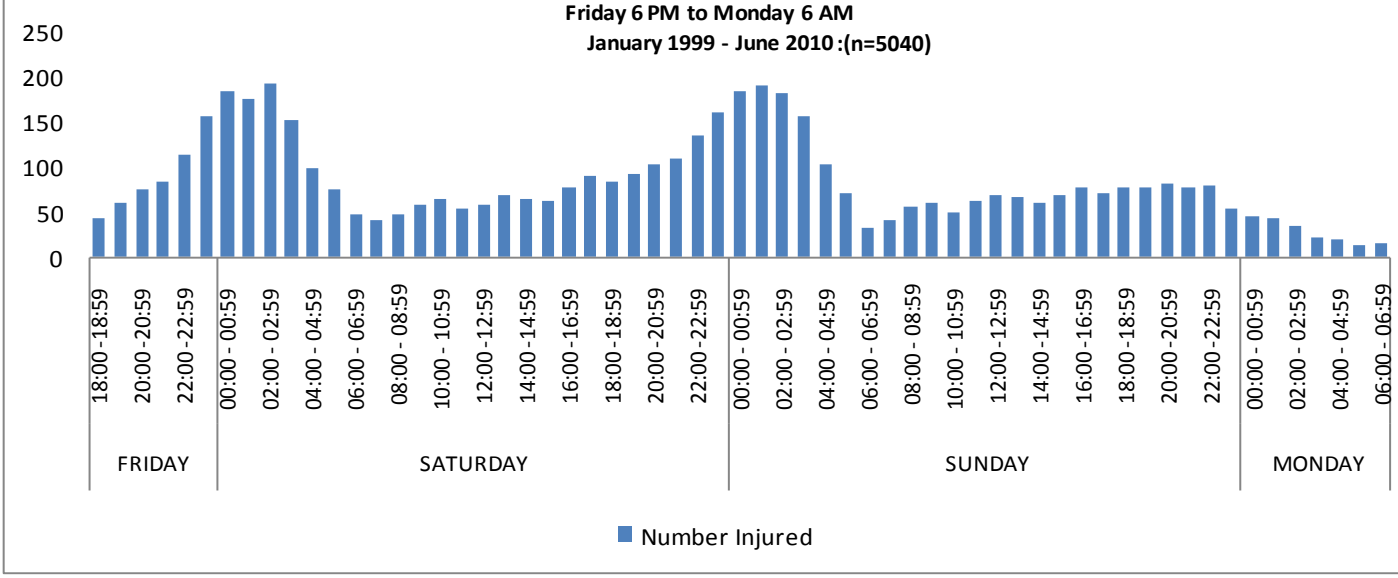
Figure 3: Distribution by Injury Time* and Gender for Alcohol related injuries: (n=7834) January 1999 - June 2010



*Injury Time: 1597 exclued where time of injury unknown

Attend time at ED is accurately captured by the triage nurse. **Figure 4** shows that the majority of alcohol related injury presentations (5040/ 9431 or 53%) attended ED between 18:00 on a Friday and 06:00 on a Monday, with 18% (1644/9431) attending on a Friday-Saturday or Saturday-Sunday night between the hours of 22:00 and 03:00.

Figure 4 : Attend Time Distribution for Alcohol related injuries on Weekend Friday 6 PM to Monday 6 AM January 1999 - June 2010 :(n=5040)



Place of Injury:

Table 1 presents cases of alcohol related injury distributed by age group and location of injury. Alcohol related injuries over the 11.5 year period were most commonly reported to have occurred in a home (3659/9431 or 39%) followed by public space (2218/ 9431 or 23%). The proportion of alcohol related injuries sustained in a home were lowest in the 18-24 year age group at 31% and highest in the over 65 year age group at 56%. Only 15% of alcohol related injuries across all ages (1420/9431) could be identified as having occurred in a licensed venue. This proportion peaked at 22% in the 18-24 year age group. Only 3% of 12-17 year olds were identified as having sustained an alcohol related injury in a licensed venue. The location of the alcohol related injury could not be identified in 22% (2116/9431) of cases.

Table 1 : Distribution by Age Group and of Place of injury of alcohol related injuries: January 1999– June 2010: (n=9431)

Place of Injury	12-17	18 - 24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Unknown	Total
Home	400	870	506	419	403	337	238	153	116	75	135	7	3659
Public Space	254	696	272	232	226	187	119	86	62	29	52	3	2218
Unspecified	233	613	343	228	206	165	155	76	41	25	28	3	2116
Licensed venue	27	623	268	159	114	69	64	37	17	10	26	6	1420
Workplace	1	4	5	4	3	-	-	-	-	-	-	1	18
Total	**915**	**2806**	**1394**	**1042**	**952**	**758**	**576**	**352**	**236**	**139**	**241**	**20**	**9431**

Type of alcohol related injury:

Table 2 presents all alcohol related injury presentations by age group and type of alcohol related injury. The most common type of alcohol related injury over the 11.5 year period was assault (3579/9431 presentations or 38%). Overall, this was followed in order of frequency by alcohol related injury-other, alcohol poisoning/intoxication, intentional self-harm and RTC. This was consistent across all age groups between 18 and 49 years. In 12 to 17 year olds, alcohol poisoning/ intoxication became the second most common reason for presentation after assault, followed by alcohol related injury-other and intentional self-harm. For those 50-54 years alcohol related injury-other was the most common reason for presentation, followed by alcohol related assault, then alcohol poisoning/ intoxication. For those over 55 years, alcohol related injury-other was still the most common reason for presentation followed by alcohol poisoning/ intoxication, then assault. For males, the pattern of alcohol related injury type by age was consistent with the pattern described above. For females the pattern varied significantly. Assault ranked as the primary type of alcohol related injury for females aged 18 to 44 years. For females over 45 years of age, alcohol related injury-other ranked first. Intentional self-harm ranked second for females aged 12 to 17 years, 25-29 years and 50-54 years.

Table 2: Distribution by Age Group and Type of alcohol related injury: January 1999—June 2010: (n=9431)

Place of Injury associated with Alcohol Use	12-17	18 - 24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Unknown	Total
Alcohol related Assault	271 30%	1200 43%	580 42%	446 43%	421 44%	279 37%	195 34%	103 29%	38 16%	18 13%	18 7%	10 50%	3579 38%
Alcohol Poisoning/ Intoxication	262 29%	492 18%	229 16%	157 15%	138 14%	109 14%	102 18%	67 19%	56 24%	43 31%	75 31%	5 25%	1735 18%
Intentional Self-Harm	143 16%	151 5%	186 13%	120 12%	133 14%	112 15%	81 14%	52 15%	27 11%	11 8%	13 5%	2 10%	1031 11%
Road Traffic Crash (RTC)	29 3%	112 4%	48 3%	37 4%	29 3%	20 3%	9 2%	8 2%	4 2%	4 3%	3 1%	-	303 3%
Alcohol related injury-Other	210 23%	851 30%	351 25%	282 27%	231 24%	238 31%	189 33%	122 35%	111 47%	63 45%	132 55%	3 15%	2783 30%
Total	**915**	**2806**	**1394**	**1042**	**952**	**758**	**576**	**352**	**236**	**139**	**241**	**20**	**9431**

Mechanism of Injury:

The Top 10 mechanisms of Injury accounted for just over 85% (8061/9431) of all alcohol related injuries during the 11.5 year period (**Table 3**). In keeping with the high proportion of alcohol related assaults in the data, the predominant mechanism of injury was 'contact with person' accounting for 30% of all alcohol related injuries (2844/9431). This injury mechanism was more common in males (male to female ratio of 3.1:1). Ingestions (a mechanism that includes acute alcohol toxicity as well as co-ingestion of other substances) accounted for 12% (1107/9431) of all alcohol related injury presentations. The male to female ratio was reversed in this group (0.6:1). Overall, falls of all types accounted for 22% (2068/ 9431) of all alcohol related injury presentations (includes a small number of high falls not shown in the table).

Table 3: Distribution by Mechanism of Injury (Top 10) and gender of Alcohol related injury: January 1999—June 2010: (n=8061)			
Mechanism of Injury (Top10)	**Male**	**Female**	**Total**
Contact with person	2153	691	2844
Cutting, Tearing	778	343	1121
Ingestion (oral overdose)	431	676	1107
Fall by Slipping, Tripping on Same Level	314	186	500
Fall by Stumbling on same level	337	159	496
Contact with static object	382	113	495
Contact with moving object	317	139	456
Other Specified Fall	315	125	440
Acute over Extension / Exertion (one off)	257	122	379
Fall / Jump from Lesser Height (Less than 1 Meter)	155	68	223
Sub- Total	**5439 (86%)**	**2622 (84%)**	**8061 (85%)**
TOTAL	**6322**	**3109**	**9431**

Body Region:

The Top 10 body regions shown in **Table 4** accounted for almost 86% (8064/ 9431) of all alcohol related injuries during the 11.5 year period. Trauma to the head and face was most common, with 2235 head injuries and 1168 facial injuries together accounting for 36% (3403/ 9431) of all alcohol related injuries. Body location not required includes injuries due to poisoning (alcohol with or without other substances, as well as other systemic injuries (immersion events, threat to breathing etc) and was the next largest group (1821/9431 or 19%).

Table 4: Distribution by Body Region Injured (Top 10) and Age Group of alcohol related injury: January 1999—June 2010: (n=8064)													
Body Region	**12 - 17**	**18 - 25**	**26-30**	**31-35**	**36-40**	**41-45**	**46-50**	**51-55**	**56-60**	**61-65**	**65+**	**Unknown**	**Total**
Head (excludes face)	131	637	313	238	228	206	153	108	74	50	91	6	2235
Body location NOT REQUIRED	362	400	263	186	185	150	104	79	40	18	32	2	1821
Face(excludes eye)	76	407	174	144	122	83	64	34	23	16	21	4	1168
Hand(includes fingers)	104	348	121	99	68	58	29	18	14	7	7	-	873
Unspecified bodily location	35	123	68	55	55	31	31	22	12	10	13	2	457
Forearm	32	128	71	42	41	28	20	9	5	7	9	2	394
Thorax	12	48	36	43	43	36	41	12	12	6	8	-	297
Multiple injuries	23	87	33	33	34	31	18	12	5	2	7	1	286
Foot (includes toes)	29	113	57	25	20	9	13	7	4	4	1	1	283
Ankle	17	96	42	30	19	20	9	3	10	1	3	-	250
Sub- Total	**821**	**2387**	**1178**	**895**	**815**	**652**	**482**	**304**	**199**	**121**	**192**	**18**	**8064**
Total	**915**	**2806**	**1394**	**1042**	**952**	**758**	**576**	**352**	**236**	**139**	**241**	**20**	**9431**

Severity:

Table 5 presents the distribution of cases by triage code and type of alcohol related injury. Eight percent of patients (743/9431) presented with high acuity injuries requiring attention within 10 minutes (102 triage category 1 and 641 triage category 2). The male to female ratio for the 'severe' alcohol related injury group was 1.5:1. Presentations due to intentional self harm accounted for 37% (273/743) of all 'severe' alcohol related presentations, with a male to female ratio within this group of 0.7:1. There was one alcohol related death that occurred in the ED, a young male who presented following a motor bike crash. He was not wearing a helmet at the time of the crash.

Table 5: Distribution by Triage Code and Type of alcohol related injury: January 1999—June 2010: (n=9431)						
Triage Code	**Alcohol related Assault**	**Alcohol poisoning/ Intoxication**	**Intentional Self-Harm**	**Road Traffic Crash (RTC)**	**Alcohol related injury -Other**	**Total**
Resuscitation (immediate)	10	23	35	16	18	102
Emergency (10 minutes)	88	114	238	67	134	641
Urgent (30 minutes)	1014	519	581	135	811	3060
Semi urgent (60 minutes)	2094	876	168	78	1556	4772
Non urgent (120 minutes)	361	199	9	6	259	834
Unspecified	12	4	-	1	5	22
Total	**3589**	**1739**	**1043**	**304**	**2785**	**9431**

Overall, 1733/ 9431 or 18% of patients required admission (139 or 1.5% required transfer to another hospital). Ten percent of patients (984/9431) either did not wait to be seen or left after treatment commenced. The majority of patients were discharged (6713/9431 or 71%). This data is presented in **Table 6**.

Table 6: Distribution by Mode of Separation and Type of alcohol related injury: January 1999—June 2010: (n=9431)						
Mode of Separation	**Alcohol related Assault**	**Alcohol Poisoning/ Intoxication**	**Intentional Self -Harm**	**Road Traffic Crash (RTC)**	**Alcohol related injury-Other**	**Total**
ED service event completed - Discharged	2660	1256	463	195	2139	6713
Admitted (excludes ED Bed)	411	285	455	77	366	1594
Left after treatment commenced	226	74	55	15	134	504
Did not wait	240	97	25	5	113	480
Transfer to another hospital	42	23	33	10	31	139
Died in ED	-	-	-	1	-	1
Total	**3579**	**1735**	**1031**	**303**	**2783**	**9431**

Assault:

The distribution of alcohol related injuries by assault status and age group is presented in **Table 7**.

Assault accounted for 38 % of all alcohol related injury presentations during the 11.5 year study period (3591/9431), 42% (2638/6322) in males and 31% (953/3109) in females. Patients in the 7 year age group of 18-24 years accounted for 33% (1204/3591) of alcohol related assault presentations. For males, alcohol related assaults (including sexual assault) as a proportion of all alcohol related presentations by age group peaked in the 18 to 24 year age group (48%) followed by the 30 to 34 year age group (47%). For females, the peak occurred in the 34-39 year age group (41%). Amongst the assault injuries, there were 29 cases of alcohol related sexual assault identified during the 11.5 year period, 4 in males and 25 in females.

Table 7 : Distribution of Alcohol related assault presentations by Age group and Gender: January 1999—June 2010: (n=9431)													
Alcohol related presentations	**12 - 17**	**18 - 24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65+**	**Unknown**	**Total**
No Assault	**635**	**1593**	**811**	**593**	**525**	**476**	**377**	**249**	**198**	**121**	**223**	**10**	**5811**
Male	325	1041	534	384	328	304	230	146	132	86	163	7	3680
Female	310	552	277	209	197	172	147	103	66	35	60	3	2131
Assault	**272**	**1204**	**580**	**445**	**425**	**282**	**197**	**103**	**37**	**18**	**18**	**10**	**3591**
Male	181	958	440	315	292	172	138	78	28	14	14	8	2638
Female	91	246	140	130	133	110	59	25	9	4	4	2	953
Sexual Assault	**8**	**9**	**3**	**4**	**2**	**-**	**2**	**-**	**1**	**-**	**-**	**-**	**29**
Male	1	2	1	-	-	-	-	-	-	-	-	-	4
Female	7	7	2	4	2	-	2	-	1	-	-	-	25
Total	**915**	**2806**	**1394**	**1042**	**952**	**758**	**576**	**352**	**236**	**139**	**241**	**20**	**9431**

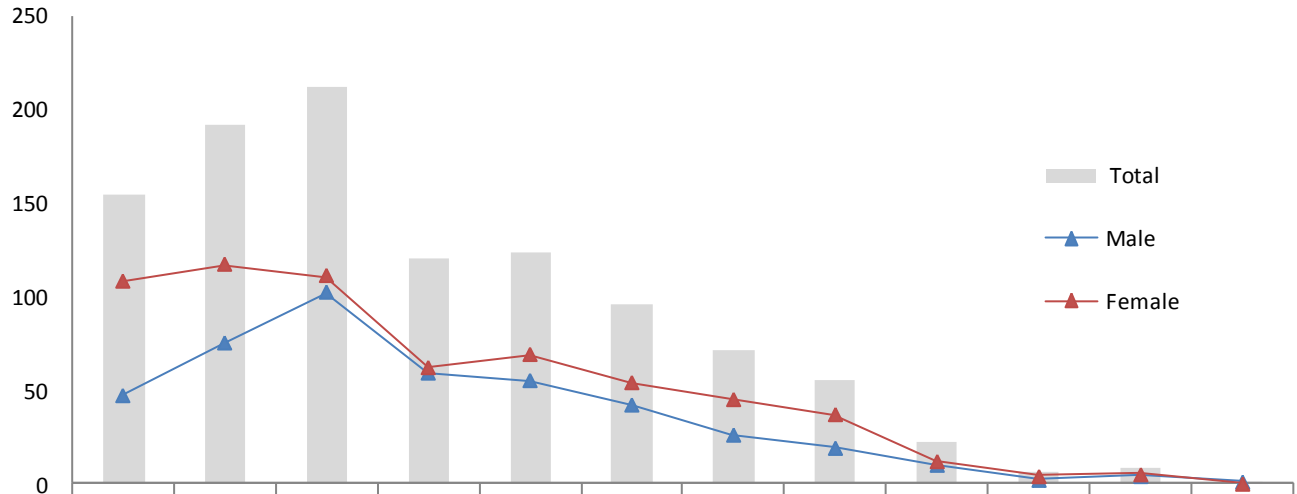
The most common place identified for alcohol related assaults to occur was a home (1020/3579 or 28%). The location of the assault was not specified in 26% of cases (916/3579). An equal proportion of alcohol related assaults occurred in licensed premises and public spaces (23%). Assault accounted for 58% (824/1420) of alcohol related injuries occurring in licensed venues. This data is presented in **Table 8**.

Table 8 : Distribution by Place of injury and Type of alcohol related injury: January 1999—June 2010: (n=9431)						
Type of Alcohol related injuries	**Home**	**Public Space**	**Unspecified**	**Licensed venue**	**Workplace**	**Total**
Alcohol related Assault	1020	804	916	824	15	3579
Alcohol poisoning/ Intoxication	726	344	468	197	-	1735
Intentional Self- Harm	775	60	190	6	-	1031
Road Traffic Crash (RTC)	5	296	2	-	-	303
Alcohol related injury- Other	1133	714	540	393	3	2783
Total	**3659**	**2218**	**2116**	**1420**	**18**	**9431**

Associated drug use:

Use of prescription and non prescription medication as well as other substances was identified as a cofactor in 11% of alcohol related injury presentations (1066/ 9431). This data is presented in **Figure 4**. Females predominated with a male to female ratio of 0.7: 1 (442 males: 624 females). The largest group for co-use of substances was the 25-29 year age group (213/1066 or 20%). However, proportionally, drug co-use was most common for the 12-17 year age group and was present in 11% of all alcohol related injury presentations in males and in 17% of presentations by females in that age group. In the majority of cases, the drug use was intentional. There were 122 cases where the presentation was identified as being associated with suspected drink spiking. This occurred more frequently in females with a male to female ratio of 0.4 to 1 (33 males to 89 females). Sniffing of volatile substances was identified in only 21 of the alcohol related injury presentations. Again, this was more common in females. Co-use of energy drinks (Red Bull, Coke, Energy drink "V" etc.) was documented in the injury description field of only a small number of cases (27/ 9431 or 0.3%).

Figure 4: Distribution by Age Group and Gender of Alcohol related injuries associated with substance use: January 1999 - June 2010: (n=1066)



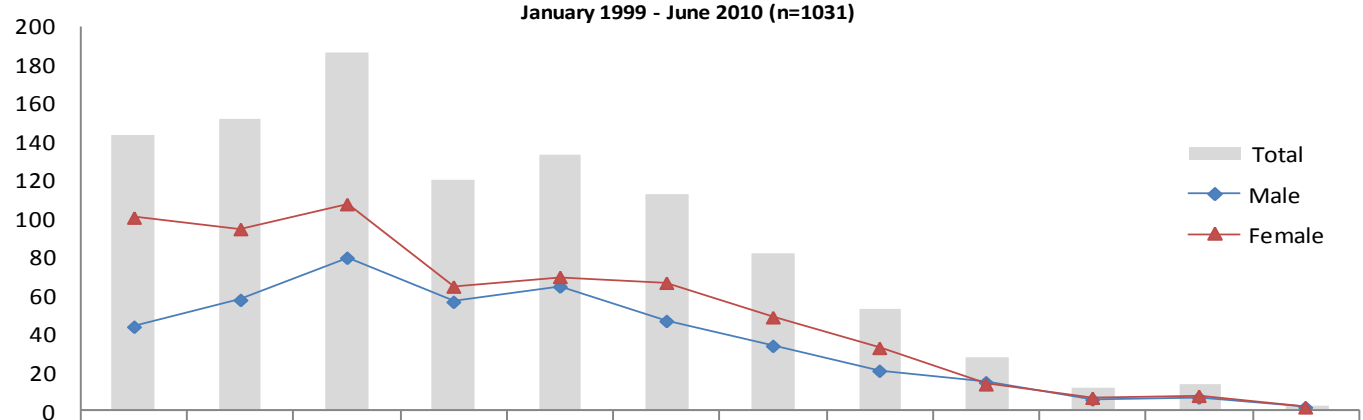
	12 - 17	18 - 24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Unknown
Total	155	192	213	121	124	96	71	56	22	6	9	1
Male	47	75	102	59	55	42	26	19	10	2	4	1
Female	108	117	111	62	69	54	45	37	12	4	5	

Self Harm:

Self-harm presentations accounted for 11% (1031/9431) of all alcohol related injury presentations during the study period. Females accounted for the majority of presentations in this group (607/1031 or 59%) with a male to female ratio of 0.7:1. Presentations due to self-harm are shown in **Figure 5**, distributed by age group and gender. Self-harm accounted for 37% of high acuity alcohol related injury presentations (273/743) with females making up 60% of this group (164/273).

Overall, 47% of patients presenting with alcohol related self-harm were admitted/ transferred (480/1031) accounting for 28% of all alcohol related injury admissions/ transfers to another hospital (480/1733). The most common injury mechanism for alcohol related self-harm was 'ingestion' (alcohol and other substances) accounting for 64% (660/1031). The next common mechanism of self-harm injury was 'cutting' accounting for 20% (208/1031). Within the high acuity group, the most common mechanism of injury was ingestion (227/273 or 83%). The number of self-harm presentations peaked in the 25-29 year age group (186/1031; 18%). Female predominance was more dramatic in the 12-17 year age group with a male to female ratio of 0.4:1.

Figure 5: Distribution by Age Group and Gender of Alcohol related Self-Harm injuries: January 1999 - June 2010 (n=1031)

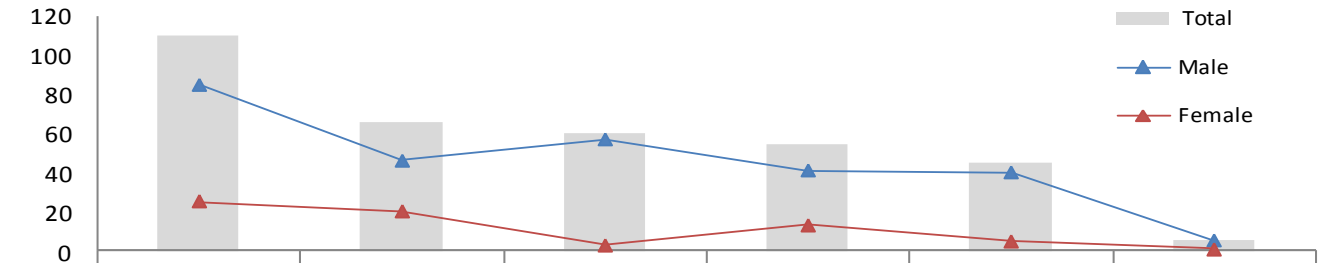


	12 - 17	18 - 24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Unknown
Total	143	151	186	120	133	112	81	52	27	11	13	2
Male	43	57	79	56	64	46	33	20	14	5	6	1
Female	100	94	107	64	69	66	48	32	13	6	7	1

Road traffic crash:

There were 341 presentations due to an alcohol related road traffic crash (RTC) accounting for 3.6% (341/9431) of all alcohol related injury presentations during the 11.5 year period. In all but one case, the patient was the one identified as having consumed the alcohol. Eighty percent of patients who presented following an alcohol related RTC were male (274/ 341). One third (32%) were driving a vehicle (110/341). Motorcycle drivers and passengers involved in an alcohol related RTC were almost exclusively male (94%). Proportionally, females were most commonly injured as vehicle passengers, comprising 30% of injuries in that group. This data is presented in **Figure 6**.

Figure 6: Distribution by Age Group and Gender of Alcohol related Road Traffic Crash Injuries: January 1999 - June 2010: (n=341)



	Driver	Vehicle Passenger	Motorcycle Driver	Pedestrain	Cyclist	Motorcycle Passenger
Total	110	66	60	54	45	6
Male	85	46	57	41	40	5
Female	25	20	3	13	5	1

Abusive behaviour:

There were 87 cases where the patient was said to be 'abusive' or 'aggressive'. This group includes patients who are potentially aggressive for a variety of reasons (acute brain injury, intoxication, mental health factors). Only six cases were identified where the patient was clearly threatening to staff. This comprises 1% of the data set and is likely to be a significant underestimate of abusive behaviour in patients presenting with alcohol related injury.

Discussion

The identification of and proportional attribution of alcohol involvement in reported health data is problematic. Whilst alcohol use in patients is clinically relevant for patient treatment and sometimes documented in clinical notes, the relative contribution of alcohol use and abuse is less reliably documented in routinely collected health reporting data. This is particularly so for data collected in Emergency Departments (EDs), that see the bulk of alcohol related injuries, yet have few ancillary support staff to collate and code alcohol related injury presentations. Paucity of accurate data relating to alcohol involvement in other sectors (ambulance, police) as well as health has been noted by the Queensland Parliamentary review committee.[5]

Some groups have attempted to address this shortcoming in health data by developing alcohol aetiologic fractions (AEF) for certain injuries as identified by the International Classification of Disease (ICD) codes.[6,7] An alcohol aetiologic fraction is a calculated fraction that allows one to estimate the burden of alcohol related injury by multiplying the number or cost of injury presentations by this fraction. For example, the alcohol aetiologic fraction for ICD codes related to facial trauma will be quite high, as a large proportion of facial trauma seen within public hospitals is due to alcohol related assault. This strategy has been developed predominantly using coronial data or inpatient health data where detailed clinical notes are available to trained coders, who are then able to estimate the proportion of alcohol causation associated with certain injury categories (as defined by the ICD code).

Once validated, the AEF can be applied to routinely reported health data in order to estimate the burden of alcohol related disease. However, in order to estimate the burden of alcohol related injury, this tool relies largely on reporting of external cause rather than diagnostic ICD codes. For example, alcohol aetiologic fractions have been calculated for external causes of injuries commonly associated with alcohol; falls, assault, road traffic crashes. Application of this technique to emergency data is problematic for a number of reasons. Inpatient medical records are coded by trained clinical coders using the rules and conventions of ICD-10-AM. This coding includes the assignment of an external cause code whenever an injury diagnosis code is assigned. In contrast, emergency departments in Queensland operate with a truncated list of ICD codes that includes only diagnostic codes. This ICD code is assigned by the treating clinician when the patient is discharged from the ED. Most of these clinicians have a limited knowledge of ICD-10-AM and the associated coding rules. The current EDIS diagnostic code list does not contain any external cause codes and so precludes the use of these codes for AEF analysis.

Assumptions are also made about the consistency of ICD coding by clinicians within the EDIS dataset. In general, a presentation will be coded by the single most serious ICD code. For example a patient who has sustained injuries during a road traffic crash might be coded as 'multiple injuries', but may alternatively be coded as a 'head injury', with other significant injuries unrecorded in the EDIS system.

Whilst there is scope for entering a second diagnosis within EDIS, this is not routinely completed by clinicians. On a national level, inconsistencies between the current ED electronic systems and within like systems make application of the AEF problematic.

The QISU dataset combines data routinely collected in EDIS/ HBCIS (demographic data, triage text, triage allocation, separation status and ICD code) with additional coded information (e.g. location of injury, external cause, mechanism of injury, major injury factor). This allows more detailed analysis of injury events than would be possible from examining the EDIS data alone. The EDIS and HBCIS systems were developed to assist patient flow and management within the ED rather than with data searching and injury prevention in mind. Whilst retrieving data by diagnosis category is straightforward, retrieving data by external cause or injury topic (e.g. road traffic crash, fall, bicycle crash) is challenging. The injury surveillance module allows a combination of search strategies to be applied, with better case yield.

The initial search within the QISU database to identify alcohol related injury involved a search of 'alcohol' and 'intoxicated' in the triage text field coupled with the alcohol code in the major injury factor field. This strategy identified 4230 cases. The expanded search strategy was then developed using additional triage text search terms that were identified from cases captured in the initial search. These additional search terms included different generic, marketing and colloquial terms for alcohol products (rum, vodka, 'XXXX', Bundy), and other terms used to identify consumption of alcohol like 'drinking', 'fight at pub' etc. The full methodology used in preparation of this bulletin will be published as a separate paper.

Using this expanded search strategy, the number of alcohol related injury cases identified was increased by a factor of 2.2. Despite this, it is likely that the true proportion of injuries seen in ED that are alcohol related is higher than the 3% identified in this report. QISU is only able to identify alcohol as a contributor to the injury, if the triage nurse makes a comment in the triage text, or codes alcohol as the major injury factor or the patient is given an ICD code specific to alcohol intoxication. For example, a person who has sustained a head injury in a road traffic crash might be the driver, and may have consumed a significant amount of alcohol prior to the crash. If that person is brought in unconscious, the nurse may indicate that the person smells of alcohol, but would be unable to take a history to establish how much alcohol that person consumed or whether alcohol contributed to the crash. That case may be entered without reference to alcohol in the triage text or major injury factor codes, and receive an ICD code appropriate for the head injury. Therefore, it could not be identified in the QISU (or EDIS) data as an alcohol related injury.

Studies using ED based patient surveys have suggested that the proportion of alcohol related injuries is significantly higher than demonstrated in this analysis. A 2001 QLD study demonstrated that recent

alcohol use (within the last 6 hours) occurred in 35% of injured patients interviewed compared to 19% of non-injured population based control cases.[8] In the same report, 18% of surveyed injured patients had consumed at 'risky/ high risk' levels in the 6 hours prior to ED presentation, compared to 6.5% of controls.

In many instances, one or more people may be injured as a direct result of alcohol consumption by another person. Identifying these people within the QISU data or even using patient surveys is also problematic. Using the example above, other people within a vehicle, who were also injured as a consequence of the driver's impaired judgment due to alcohol consumption, cannot be identified within the QISU data set, unless the triage nurse knows and identifies the full story in the triage text. In some instances trauma cases are spread across different hospital EDs, so a reporting site may not get the full story. Similarly, pedestrians may be hit by 'drunk drivers' or people may be assaulted by intoxicated strangers or family members, and that information is not known, reported to or recorded by the triage staff.

Alcohol related injuries that result in death, where the death occurs at the scene, will not be recorded in health data. Very few deaths occur in the emergency department. There was only one alcohol related death in the ED identified within this data set; a motorcycle crash fatality. Deaths that occur later in the health service similarly will not be identified within the ED datasets. It is beyond the scope of this bulletin to examine other data sources for alcohol related injury death data as this would require detailed review of coronial information.

Assault makes up a significant proportion of all alcohol related injuries reported in this bulletin comprising 38% of all alcohol related injuries overall and 41% of all alcohol related injuries in males. Although assault accounted for 58% of alcohol related injuries occurring at licensed venues, this represented only 23% of all alcohol related assaults identified within the data set. The majority (29%) of alcohol related assaults occurred at home. A search of all assault presentations (12 years of age and over) in the QISU database revealed that alcohol could be identified as a factor in 31% of assault cases.

For many alcohol related assaults, police or ambulance intervention is often the trigger for ED presentation (whether they were called by bystanders or happened to be on scene). However, there are likely to be many cases of alcohol related assault where the person presents to ED the following day (when no longer intoxicated), or does not present at all. It is likely that the number of alcohol related assaults that occur away from entertainment venues are significantly underrepresented in this dataset. This may be particularly so for women who may choose not to present rather than identify the assault and the perpetrator.

Within this QISU dataset, the number of alcohol related sexual assaults are also likely to be significantly underestimated. This may be due to cases declining to present to any health service, or presenting to alternative health services (sexual assault services, general practitioners). Similarly, we believe that the number of abusive and threatening patients within this data set is underestimated. Anecdotal evidence suggests that the number of staff assaults from patients in this group is higher than we have reported. Again, more systematic reporting of this issue within health services would better enumerate the problem.

Alcohol related injury due to self-harm comprised 11% of all alcohol related injury presentations during the study period, but 37% of the high acuity cases (requiring immediate or rapid attention) and 28% of the admissions. This high triage and high admission rate is most likely due to the co-use of alcohol with other substances that are respiratory or central nervous system depressants. These patients often require one-on-one nursing within the ED resuscitation area, followed by extended periods of observation and input from mental health assessment teams in order to assess suicide risk. Females were overrepresented within this group, particularly in the 12-17 year age group, with one quarter of the alcohol related presentations in that age group due to self-harm.

Identification of co-use of illicit substances within this dataset is also problematic. In many instances, patients may not disclose that they have consumed illicit drugs, or they may be unsure whether they have taken something or what it was. We identified only 121 cases of suspected drink spiking within our dataset. Again, this is likely to be an underestimate as this information may not be presented to the triage nurse, and may only emerge when the patient is less intoxicated, or collateral history is available from friends.

Similar to alcohol related injury due to assault, road traffic crashes with alcohol involvement are often widely publicised in the media. However, they only made up a small proportion of this dataset; 4% of all alcohol related injuries, and 4.3% of all alcohol related injuries in males. It is likely that this group of alcohol related injuries has a higher proportion of pre-hospital deaths, and therefore is again under-represented in the ED dataset.

There have been attempts to improve the level of ED based surveillance for alcohol related injury. This is aimed at both improving the current estimates of alcohol related injury and at screening for potential candidates for intervention. The WHO co-ordinated a multi-centre trial between 2000-2002, where patient injury presentations were coded for evidence of alcohol involvement based on the ICD-10 codes (International Classification of Diseases -10th revision) for alcohol

related presentations to hospital emergency departments [9]: **(see Box 1)** The assessment was clinically based and easy to do, but only found to be accurate for those who were not intoxicated (blood alcohol concentration (BAC) < 0.059) and those who were severely intoxicated (BAC > 0.299). In addition to the clinical assessment, a screening questionnaire was administered. The study reported that alcohol was involved in approximately 20% of all injury presentations overall (range 6 to 45% depending on the country).

Box 1: International Classification of Diseases (ICD-10) codes for patient injury presentations to hospital emergency departments related to alcohol consumption (recommended by WHO-2000)[9]

Y91 categories in ICD-10: Evidence of alcohol involvement determined by level of intoxication		
Y91.0	Mild alcohol intoxication	Smell of alcohol on breath, slight behavioural disturbance in functions and responses, or slight difficulty in coordination
Y91.1	Moderate alcohol intoxication	Smell of alcohol on breath, moderate behavioural disturbance in functions and responses, or moderate difficulty in coordination
Y91.2	Severe alcohol intoxication	Severe disturbances in functions and responses, severe difficulty in coordination, or impaired ability to cooperate
Y91.3	Very severe alcohol intoxication	Very severe disturbance in functions and responses, very severe difficulty in coordination, or loss of ability to cooperate
Y91.4	Alcohol involvement, not otherwise specified	Suspected alcohol involvement

One of the challenges with a clinical assessment tool is that there may be a significant delay between the injury and the presentation, allowing for mitigation of symptoms of intoxication. Similarly, a patient may smell of alcohol, but not have consumed a significant amount. Questionnaires on the other hand are seen as time consuming, intrusive, and the reliability of self-reported alcohol intake may be variable. There are added concerns that documenting and appearing to attribute the ED presentation wholly or in part to alcohol, is dangerous. There are other reasons why a patient may present in an incoherent state following an injury. This may be due to an intracranial bleed, seizure disorder or low blood sugar. In this situation there may be suspicion of alcohol involvement (a smell of alcohol or history of alcohol ingestion).

Whilst it is clinically important to identify the alcohol use as a cofactor, including the level of drinking, and the potential for alcohol withdrawal, it is dangerous to attribute the altered level of consciousness to alcohol alone.

Emergency staff in Cairns ED, in collaboration with local researchers from The James Cook University (JCU), have developed a system to prospectively identify alcohol related violence occurring in the Cairns late-night entertainment precinct (CLEP).

This was trialled over a three-month period in 2010. The system works as an automatic pop-up within the EDIS system, is triggered at discharge based on ICD code, and asks the clinician whether this ED presentation is the result of alcohol associated violence within the CLEP. The clinician has an option to answer yes, no or unsure. This question is answered based on clinical assessment, a period of observation, history taking (from the patient where possible) and other collateral sources. Importantly, clinicians reported that this data collection required little or no impost on time or other resources.

This method of data collection was compared to a retrospective chart review of ED notes. This chart review was only able to identify the location of the identified assaults in approximately 15% of cases. Preliminary analyses suggest that the prospective pop-up strategy has increased the yield of alcohol related incident counts in the CLEP by a factor of eight. Analysis of this prospectively collected data has also allowed the researchers to identify a peak in presentations due to alcohol related violence in the CLEP in the hour prior to and the hour following venue lockout (between 2 and 4 am). Venue lockout was a strategy introduced by the Queensland Government in 2006, with patrons denied re-entry to licensed premises after 03:00.

Currently, three health facilities in QLD (Gold Coast Hospital, Royal Brisbane and Women's Hospital and Cairns Hospital) have developed Drug and Alcohol Brief Intervention Teams (DABIT) that operate in part within the ED. Identification of potential clients is opportunistic, with referrals coming from health staff, as well as targeted screening of patients whose presentations fall into diagnostic categories that are highly associated with alcohol use ('fits, fights & falls', deliberate self-harm, gastrointestinal bleeding, overdoses and frequent presenters.) These teams could directly benefit from improved referral pathways generated by prospective identification of clients using the Cairns pop-up, QISU or other prospective reporting model.

This bulletin presents preliminary analysis of alcohol related injury presentations to Queensland EDs. Several other publications are under development describing the search methodology in more detail as well as examining the areas of alcohol related assault, self-harm and co-use of other substances.

Conclusion

This bulletin presents data on alcohol related injury presentations to Queensland EDs over an 11.5 year period for patients aged 12 years and over. We have employed an expanded search strategy to identify all possible cases, but believe that the data presented still underestimates the size of the alcohol related injury burden in Queensland. It is likely that cases that draw the attention of police and ambulance are better represented within the data set. This issue could be better understood if there were a standardised systematic screening and reporting system for identifying alcohol related injury presentations within the emergency health system.

Recommendations:

- **Consideration be given to systematised screening of emergency department attendees for level of acute and chronic alcohol use for clinical intervention purposes**
- **Development of better systems for documentation of screening results both within the health record and in routine health reporting systems**
- **Development of similar screening and reporting systems to identify presentations related to illicit drug use**
- **Collation of this data to better inform current debate around responsible use of alcohol**
- **Broadening of the current government focus from alcohol consumption and violence within licensed venues to include alcohol related injury due to all causes and in all settings**
- **Broadening of the current government focus from personal behaviour and reactive health and policing policy, to include factors such as alcohol advertising, purchase and consumption within the broader community**

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