



Alcohol and Injuries in the Accident and Emergency Department:

A National Perspective

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Contents

1.	Introduction	5
2.	Methodology	9
2.1	Research design	10
2.2	Study sample	10
2.3	Data collection	10
2.4	Data analysis	11
3.	Results	13
3.1	Demographics of study sample	14
3.2	Attendance at A & E in Acute Hospitals	15
3.2.1	Alcohol-related attendance	15
3.2.2	Alcohol and non-alcohol-related attendance	16
3.2.3	Attendance – day of week and time of day	17
3.3	Clinical diagnosis of the presenting injury	20
3.4	Cause of injury	21
3.5	Situational context of injury	22
3.6	Drinking pattern and drinking environment prior to alcohol-related injury	23
3.6.1	Drinking pattern	23
3.6.2	Level of intoxication	25
3.6.3	Drinking environment prior to injury	27
3.7	Typical drinking habits of all patients	28
3.8	Indicators of problems related to harmful use of alcohol	30
3.9	Repeat attendance at A & E	31
3.10	Multiple risk factors for alcohol-related problems	32
3.11	Screening tool	33
4.	Discussion	35
4.1	A & E attendance	36
4.2	Injury and related events	37
4.3	Drinking prior to the injury event	37
4.4	Typical drinking patterns	38
4.5	Alcohol-related problems	39
4.6	Screening tool	40
5.	Conclusion	41
6.	Recommendations	45
	References	46
	Appendix A	48



1 Introduction

1. Introduction

In 2000, the WHO Global Burden of Disease study reported that injuries, unintentional and intentional, accounted for 40% of the disease burden attributable to alcohol (Rehm et al., 2003). These included road and other transport injuries, falls, drowning and burning injuries, occupational and machine injuries, alcohol poisoning, suicide and assaults. The short-term effects of alcohol include diminished co-ordination and balance, slower reaction time and impaired attention and judgement, all of which increase the risk of accidental injuries. Violent incidents frequently involve alcohol use by the perpetrator, the victim, or both, and can result in homicides, assaults, sexual offences and domestic violence (Roizen, 1997). Frequent heavy drinking and acute use of alcohol (large amount on one occasion) have been associated with increased risk of injuries (Cherpitel, 1993, 1997; McLeod et al., 1999). Those presenting with violence-related injuries in the emergency room were more likely to have consumed alcohol prior to the incident and reported more frequent heavy drinking and alcohol-related problems (Cherpitel, 1997). A cross national study in the emergency room reported that the strongest predictor of alcohol-related injuries was the frequency of night time presentation to the ER facilities (Young et al., 2004). The socio-cultural factor of legal intoxication level (BAC) in a country was also reported to have a modifying influence in alcohol-related injuries (Cherpitel et al., 2003).

In Ireland, alcohol consumption increased by 41% between 1989 and 1999 (DOHC, 2002). The increase in consumption corresponded with an increase in alcohol-related mortality and in public disorder (DOHC, 2004). High risk drinking was found to be common in Ireland (Hope et al., 2005; Ramstedt & Hope, 2005). Irish drinkers experienced a greater level of alcohol-related harm in comparison to other Western European countries (Ramstedt & Hope, 2005). Among Irish males, acute harms such as fights and accidents were three times the average rate of other countries. Alcohol was a factor in parasuicide in almost half of all male cases and over one-third of female cases (NSRF, 2002). In the general hospital, 30% of males and 8% of female patients were identified as having underlying alcohol abuse or dependency problems (Hearne et al., 2002). Alcohol accounted for a substantial number of emergency in-patient admissions to acute hospitals in one health board region in Ireland, where an 80% increase was observed in the five year period 1997-2001 (O'Farrell et al., 2004). The majority were males and over half of the admissions occurred at the weekend.

Screening and Brief Intervention (SBI) in the primary healthcare setting has been successful in reducing alcohol-related problems for those with hazardous and harmful drinking patterns (Babor et al., 2003). Brief intervention is designed to motivate those who engage in high risk drinking to moderate their alcohol use. Brief intervention has been introduced to the emergency room, given the strong association between high risk drinking, accidental injuries and violence, many of which end in the A & E Department (Hungerford & Pollock, 2001). Recent studies have reported success in reducing high risk drinking among emergency room patients and also in reducing re-attendance at the A & E (Crawford et al., 2004). Effective prevention of injuries is dependent on understanding the nature and extent of the problem, identification and evaluation of risk factors and the setting of priorities for policy development. The purpose of this study was to examine the role of alcohol and injuries, with a specific focus in the A & E Departments in acute hospitals.



2 Methodology

2. Methodology

2.1 RESEARCH DESIGN

The WHO Collaborative Study on Alcohol and Injuries, involving twelve countries, developed a research protocol in 2000. The Department of Health and Children received permission to use the WHO protocol, which provided a high quality research design and allows for international comparisons. The study was conducted in the Accident and Emergency Department in six major acute hospitals in Ireland. The six hospitals were selected to achieve a wide geographic and demographic distribution across the country - Mater Misericordiae University Hospital in Dublin (MT), Beaumont Hospital in Dublin (BT), University College Hospital Galway (GA), Sligo General Hospital (SL), Letterkenny General Hospital (LK) and Waterford Regional Hospital (WT). The study protocol was approved by the ethics committee in each hospital site.

2.2 STUDY SAMPLE

The WHO protocol inclusion criteria for the study subjects were patients presenting to the A & E within 6 hours of their injury, were 18 years or older and provided a patient informed consent. Patients were sampled during a given 20 hour shift (10am to 6am), for 8 consecutive weeks, with day to night shifts rotation after every week so that, over the 14 month period of the study, each shift had been sampled an equal number of times. In each site there was equal representation of each shift for each day of the week. All patients meeting the criteria (injured within 6 hours and over 18 years) were approached after they had been triaged in A & E and invited to participate in the study. Written, informed consent was obtained for each subject. The number of eligible subjects who declined or were unable to complete the interview was recorded and included in the 2500 sampled patients. Two emergency room nurses conducted all the interviews over a 14 month period from April 2003 to May 2004.

2.3 DATA COLLECTION

Data was collected using a standard 25 minute questionnaire, which included the type and cause of the presenting injury, drinking in the six hours prior to the injury, quantity and frequency of usual drinking habits, frequency of high consumption times during the last year, indicators of alcohol problems and alcohol dependency and demographic characteristics. Blood alcohol concentration (BAC) was measured, using the Alco-Sensor III breathalyser, on patients who reported drinking prior to

injury. The BAC was obtained as soon as possible after a patient had been selected for the study and provided consent.

2.4 DATA ANALYSIS

Data were analysed using SPSS –X statistical package. Descriptive statistics are provided across hospital sites for many of the variables. However, the total sample was combined to ensure statistical power for the analysis, which examined differences between those with alcohol and non-alcohol-related injuries. Logistic regression and discriminate function analyses were undertaken to provide greater clarity and understanding of the risk factors and of possible screening procedures.



3 Results

3. Results

The results section presents a national profile of patients in attendance with an injury at A & E in Acute Hospitals. Comparisons were made between those who reported drinking in the 6 hours prior to the injury event (alcohol-related injuries) and other injuries (non-alcohol-related injuries) across gender and age. The results from each of the six hospital sites are presented in Appendix A and included in the general results section, where relevant.

3.1 DEMOGRAPHICS OF STUDY SUBJECTS

In total, 2500 patients, presenting at A & E Departments within 6 hours of an injury, were invited to participate in the study. Of those invited to participate, 84% gave consent and completed all the elements of the interview, while 5% refused, a further 4% were too intoxicated to complete the interview, 3% could not be located or left and 2% were too severely injured (Table 1). The consent rate was similar across the six hospital sites. Of the total sample, two-thirds were male and one-third female. Three-quarters of those in attendance with an injury at A & E were under 50 years of age.

Table 1: Patients recruited to study

	N	%
No. of patients recruited to study	2500	
Consent given		
Yes	2093	83.7
No	407	16.3
Why not consent -		
Refused	127	5.1
Too intoxicated	96	3.8
Could not locate/left	79	3.2
Too severely injured	46	1.8
Other	59	2.4
Gender		
Male	1630	65.2
Female	870	34.8

Across hospital sites, a higher proportion of A & E patients in the 18-29 age group were evident in the Galway and Sligo hospitals in comparison to other sites. A lower proportion of patients in the Mater and in Letterkenny were in paid employment. The Mater patients had significantly lower educational attainment in comparison to Waterford, Beaumont and Galway. Patients presenting with an injury in Letterkenny had significantly less average monthly income than Beaumont, which had the highest

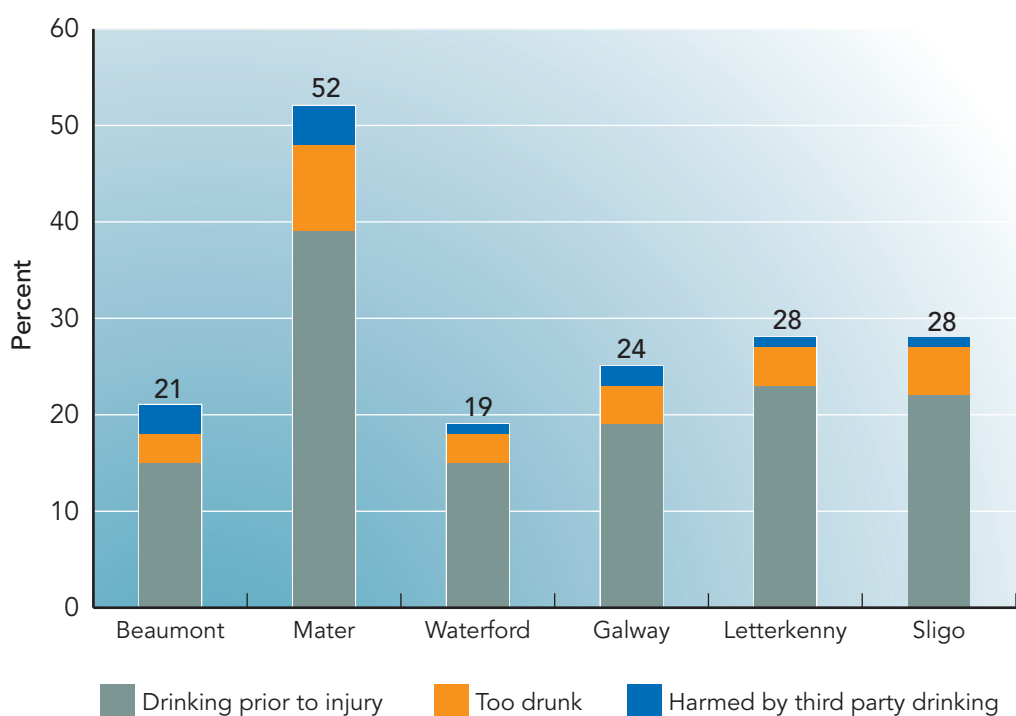
monthly income. Demographic details of patients recruited to the study by hospital sites are provided in Appendix A.

3.2 ATTENDANCE AT ACCIDENT AND EMERGENCY IN ACUTE HOSPITALS

3.2.1 Alcohol-related attendance

Over one-quarter (28%) of patients in attendance with an injury at A & E in Acute Hospitals were related to alcohol consumption prior to the injury. This represented a total of 618 patients, of whom 478 (22%) reported drinking in the 6 hours prior to their injury, an additional 96 (4%) who were too intoxicated to complete interview and a further 44 (2%) patients reported their injury was caused by a third party who was drinking at the time of them sustaining their injury. Across hospital sites, the Mater Hospital in Dublin had the highest rate, with over half of those attending the A & E directly related to alcohol injuries. Sligo and Letterkenny had the second highest rates related to alcohol at 28%, while Waterford had the lowest rate (Figure 1). Less than one percent of the total study sample had used other substances/drugs.

Figure 1: Alcohol injury-related attendance at A & E



3.2.2 Alcohol and non-alcohol-related attendance

The following analyses are based on those who gave consent and who completed all elements of the interview (N=2085). Those who reported drinking in the 6 hours prior to their injury were deemed to be alcohol-related injuries. Overall, two-thirds of those in attendance at the A & E were male (Table 2). However, of those presenting with alcohol-related injuries, three-quarters were males, in comparison to one-quarter of females. The 18 to 29 age group had the highest proportion (45%) of those in attendance, while those over 65 years had the lowest (12%). A higher proportion of patients with non-alcohol-related injuries were working at least 30 hours or more a week, in a paid job, in comparison to those with alcohol-related injuries. The average number of years in formal education and the average monthly income were significantly higher for those attending with non-alcohol-related injuries, in comparison to those with alcohol-related injuries. However, the monthly income was not reported for one-third of the subjects.

Table 2: Demographics of those who consented to participate in study

	Non-alcohol-related injury N=1607	Alcohol-related injury N=478	Total N=2085
	%	%	%
Gender			
Male	62.2	73.8	64.9
Female	37.8	26.2	35.1*
Age group			
18-29 yrs	44.5	47.6	45.2
30-49 yrs	29.0	30.8	29.4
50-64 yrs	12.6	14.5	13.0
65+	13.9	7.1	12.4
In paid job (30+ hrs)			
Yes	55.6	46.0	53.4
No	44.1	52.5	46.0
Refused	0.3	1.5	0.6
Years of formal education			
Mean (SD)	13.62 (2.7)	12.54 (2.5)	13.38 (2.7)
Monthly income (n=1347)			
Mean (SD)	€1707 (€921)	€1533 (€1035)	€1670 (€948)

* significant between alcohol and non-alcohol-related groups ($p < .001$)

3.2.3 Attendance – Day of week and time of day

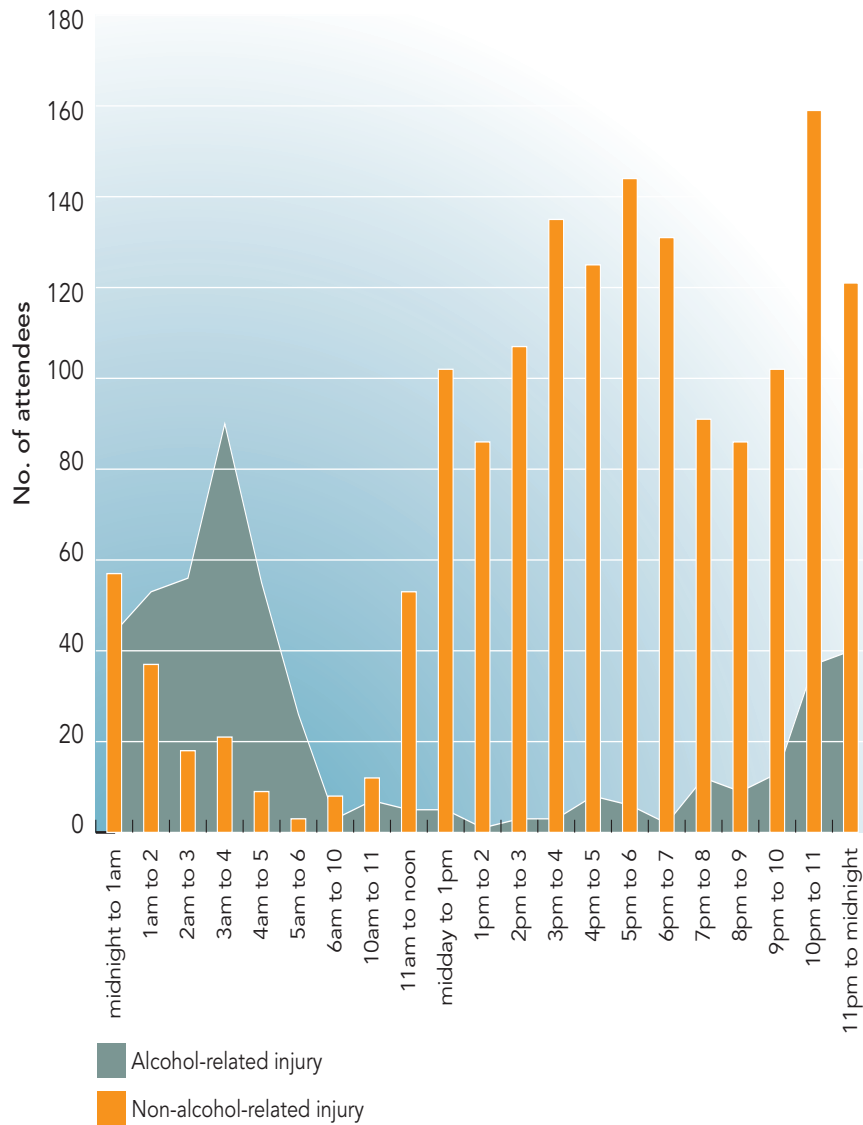
Overall, the days of the week with the highest injury-related attendance rates were Saturday and Sunday. Midweek days of Wednesday and Thursday also had relatively high attendances. It is important to note that these figures do not reflect all patients in attendance at the A & E, only those who presented within 6 hours of an injury. Comparing alcohol and non-alcohol-related injuries, significant differences emerged (Table 3). The weekend days of Saturday and Sunday showed increased numbers in attendance for alcohol-related injuries, with the highest rate on a Sunday with over one-third (36%) in attendance.

Table 3: A & E Attendance – day of week

	Non-alcohol-related injury	Alcohol-related injury	Total
	No. of attendance (% within day)	No. of attendance (% within day)	No. of attendance
Monday	125 (79.1)	33 (20.9)	158
Tuesday	175 (89.7)	20 (10.3)	195
Wednesday	266 (85.5)	45 (14.5)	311
Thursday	284 (85.3)	49 (14.7)	333
Friday	222 (78.4)	61 (21.6)	283
Saturday	292 (68.5)	134 (31.5)	426
Sunday	243 (64.1)	136 (35.9)	379

Overall, the top peak times of the day for injury presentations were between midday and midnight, with the highest number of patients attending the A & E between 10pm and 11pm (Figure 2). Coverage of the 6am to 10am period was low, due to field workers' rostering and therefore, this period is under represented. Alcohol-related injury attendance began to increase from 7pm onwards and saw substantial increases from 10pm which peaked between 3am and 4am, and continued to have substantial rates until 6am. Attendance for non-alcohol-related injuries was highest between 10pm-11pm. During the same period, alcohol-related attendances were also increasing.

Figure 2: Attendance at A & E – Time of day



Combining the time of day and the day of week, two contrasting patterns emerged between alcohol and non-alcohol-related attendance. Between 6pm and midnight on all days of the week, a significantly higher proportion of those in attendance at the A & E were non-alcohol-related injuries. Between midnight and 6am on six of the seven days of the week (except Wednesday), a higher proportion of attendances were alcohol-related injuries (Figure 3).

Figure 3: Attendance at A & E, midnight to 6am



Almost one-third of patients attended the A & E within one hour of sustaining their injury, the proportion of which was significantly higher for alcohol-related injuries in comparison to non-alcohol-related injuries (52% vs. 23%) (Table 4). In contrast, a higher proportion of those with non-alcohol-related injuries took four hours or more to present to A & E (38% vs. 9%).

Table 4: Time since injury event and presentation to A & E

	Non-alcohol-related injury N=1607	Alcohol-related injury N=478	Total N=2085
	%	%	%
Time since injury			
Within 1 hour	23.3	52.1	29.9*
2-3 hours	38.3	38.9	38.5
4 or more hours	38.3	9.0	31.6

* significant between alcohol and non-alcohol-related groups ($p < .001$)

3.3 CLINICAL DIAGNOSIS OF THE PRESENTING INJURY

For all patients in the study, the injury presenting in the A & E was the first treatment of the injury, in other words patients were not re-attending with this injury. The overall top three diagnoses, as clinically assessed by staff in the emergency room, were fractures (43%), cuts, bites, penetrating injuries (28%) and strain, sprain, dislocation (18%). Comparing alcohol and non-alcohol-related injuries, a number of differences emerged (Table 5). A significantly higher proportion of non-alcohol injuries were fractures (47% vs. 29%). Strains and sprains type injuries were twice as likely (20% vs. 12%) among non-alcohol-related injuries. The highest prevalence of alcohol-related injuries were cuts, bites, penetrating injury, open wound injuries (42% vs. 23%), which were at almost twice the rate of non-alcohol-related injuries. Concussion and closed head injuries were also more evident (6% vs. 2%) among those who had consumed alcohol prior to the accident, as were bruises, scrapes and superficial wounds (10% vs. 6%).

Table 5: Clinical assessment of injury by hospital medical staff

	Non-alcohol-related injury N=1607	Alcohol-related injury N=478	Total N=2085
	%	%	%
Fracture	46.9	29.5	42.9*
Cut, bite, penetrating injury, open wound	23.2	42.3	27.6
Strain, sprain, dislocation	20.0	11.9	18.1
Bruise, scrape, superficial wound	6.0	9.8	6.9
Concussion, closed head injury	2.5	5.6	3.2
Burn	1.3	0.4	1.1
Other	0.1	0.4	0.2

* significant between alcohol and non-alcohol-related groups ($p < .001$)

3.4 CAUSE OF INJURY

Patients were asked how their injury had occurred. Overall, the top four causes were falls and trips (40%) followed by struck against or caught between an object (24%), stab, cut or bites (15%) and blunt force injury (10%) (Table 6). Those who had consumed alcohol prior to their injury were more likely (14% vs. 9%) to have had a blunt force injury (in other words been physically hit) in comparison to non-alcohol-related injuries.

Table 6: Cause of injury – response of patients

	Non-alcohol-related injury N=1607	Alcohol-related injury N=478	Total N=2085
	%	%	%
Fall, trip	39.0	41.4	39.6*
Struck against /caught between	23.5	23.2	23.5
Stab, cut, bite	15.8	14.2	15.4
Blunt force injury	9.2	14.4	10.4
Driver Road Traffic Accident (RTA)	6.4	1.7	5.3
Passenger RTA	2.5	2.3	2.4
Pedestrian RTA	1.1	1.7	1.2
Burn	1.2	0.4	1.0
Other	1.4	0.6	1.2

* significant between alcohol and non-alcohol-related groups ($p < .001$)

While the vast majority of injuries (86%) were unintentional, one-third of alcohol-related injuries were intentional and perpetrated by someone else, while 6% were intentional and self-inflicted (Table 7). Of the injuries that were caused by someone else, strangers were the main perpetrator of the injury for both groups. Spouse/partner were twice as likely to be the perpetrator of alcohol-related injuries (8% vs. 4%) in comparison to non-alcohol-related injuries. Of those who perpetrated the harm/injury on others, for both alcohol and non-alcohol-related injuries, two-thirds of the perpetrators had consumed alcohol. Those with alcohol-related injuries were significantly more likely to experience the harm from a third party who had consumed alcohol, in comparison to others.

Table 7: Events around injury

	Non-alcohol-related injury %	Alcohol-related injury %	Total %
Why were you injured?	N=1607	N=478	N=2085
Unintentional	94.3	58.4	86.0*
Intentional self-inflicted	0.6	6.1	1.9
Intentional by someone else	5.1	35.1	12.0
Legal intervention	0.0	0.4	0.1
Main perpetrator	(n=82)	(n=168)	(n=250)
Stranger	62.2	57.7	59.2
Friend, acquaintance	20.7	25.6	24.0
Spouse/partner	3.7	8.3	6.8
Other relative	6.1	5.3	5.6
Other	7.3	3.0	4.4
Was perpetrator drinking who harmed/fought you?	(n=82)	(n=168)	(n=250)
Yes, definitely	47.6	78.6	65.2*
Suspected	6.1	3.6	4.1
No	32.9	7.1	18.9
Don't know, unsure	13.4	10.7	11.9

* significant between alcohol and non-alcohol-related groups ($p < .001$)

3.5 SITUATIONAL CONTEXT OF INJURY

One-third of all injuries occurred on the street or road and one-quarter happened in the injured person's home (Table 8). For those presenting in the A & E with alcohol-related injuries, half of these injuries occurred on the street or road, in comparison to one-quarter of non-alcohol-related injuries. A significantly higher proportion of alcohol-related injuries happened in a pub or other drinking place, in comparison to other injuries (24% vs. 1%). Alcohol-related injuries were significantly more likely to occur as a result of commuting (40% vs. 32%), doing nothing (40% vs. 20%) or leisure activity (18% vs. 5%), in comparison to non-alcohol-related injuries. In contrast, a higher proportion of non-alcohol injuries occurred at work and during sports, in comparison to alcohol-related injuries.

Table 8: Situational Context of Injury

	Non-alcohol-related injury N=1607	Alcohol-related injury N=478	Total N=2085
	%	%	%
Place of injury			
Street, road	27.3	51.2	32.7*
Own home	25.0	17.2	23.2
Sporting venue	15.7	0.0	12.2
Pub, hotel, other drinking place	1.3	23.9	6.5
Other	6.2	0.8	4.9
Other home	2.2	5.9	3.1
Unknown	21.9	1.0	17.1
Activity at time of injury			
Commuting, travelling, walking	31.6	40.4	33.6*
Doing nothing in particular	20.2	40.4	24.8
Paid work	24.7	0.6	19.2
Sports	16.4	0.2	12.7
Leisure	5.2	17.6	8.1
Other	1.8	0.8	1.6

* significant between alcohol and non-alcohol-related groups ($p < .001$)

3.6 DRINKING PATTERN AND DRINKING ENVIRONMENT PRIOR TO ALCOHOL-RELATED INJURY

3.6.1 Drinking Pattern

Those who presented in the A & E within 6 hours of sustaining an injury and reported drinking prior to the accident/injury were defined as alcohol-related injury attendances (N=478). Alcohol-related injured patients were asked about their drinking prior to and after their accident/injury, their level of intoxication and their drinking environment. The average number of drinks consumed prior to injury was 15 drinks for males and 11 drinks for females. However, lower rates were reported for males and females in the older age groups and a higher rate for males in the 18-29 age group.

Six out of every ten (61%) patients presenting with alcohol-related injuries had consumed 12 or more drinks, defined as harmful drinking, in the six hours prior to the accident/injury (Table 9). A drink is defined as a half pint of beer, a glass of wine or a single measure of spirits and is equivalent to 10 grams of alcohol. A significantly higher proportion of males, in comparison to females, reported drinking at such high levels (70% vs. 36%). However, drinking 5-11 drinks, defined as hazardous drinking, was evident among females, with half of the females reporting drinking at this level.

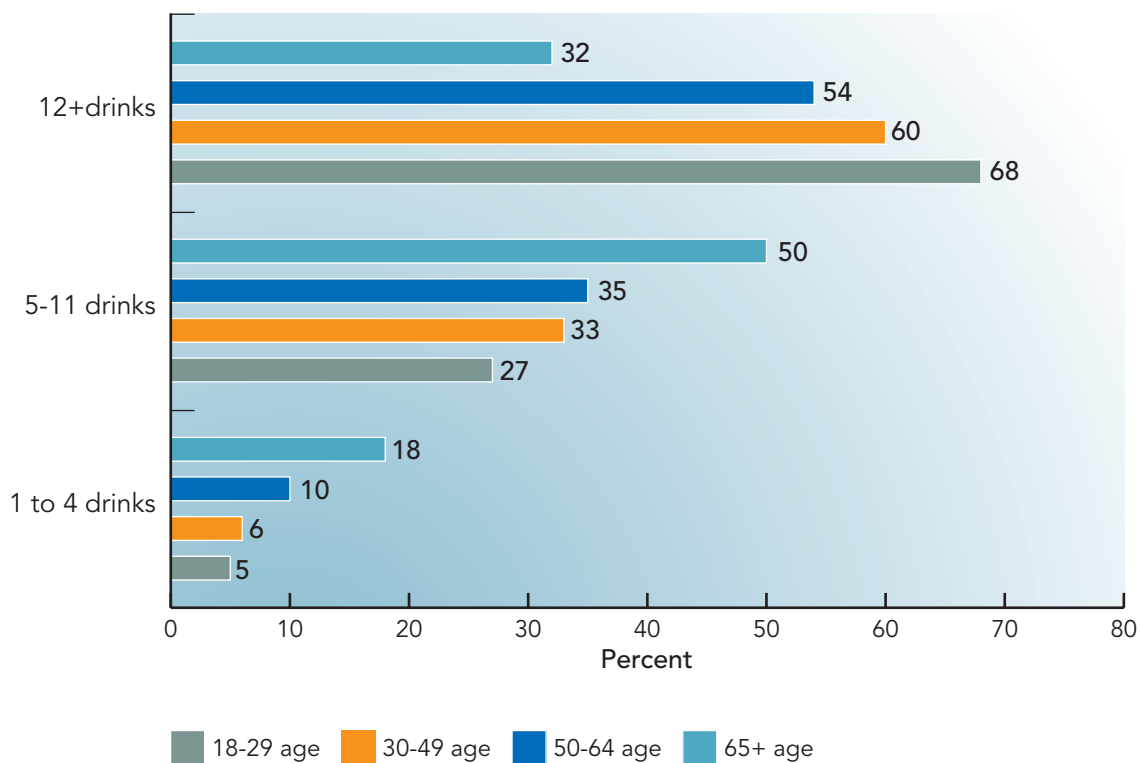
Table 9: Drinking prior to sustaining alcohol-related injury by gender

	Male N=348	Female N=122	Total N=470
	%	%	%
No. of drinks prior to injury			
1-4 drinks	4.9	13.9	7.2*
5-11 drinks	25.6	50.0	31.9
12+ drinks	69.5	36.1	60.9

* significant between males and females ($p < .001$)

A higher proportion of those between 18 and 64 years engaged in harmful drinking (12+ drinks) (Figure 4). Almost one in five (19%) of patients with an alcohol-related injury reported that their drinking was cut short by their accident. Two-thirds (64%) of those who had alcohol-related injuries reported that the accident/injury would not have happened if they had not been drinking.

Figure 4: Drinking prior to alcohol-related injury by age groups



3.6.2 Level of Intoxication

Three different measures were used to assess the level of intoxication; blood alcohol concentration, clinical assessment and self-reported intoxication. Blood alcohol concentration (BAC) of those patients who reported consuming alcohol prior to injury was measured using a breath alcohol analyser Alco-Sensor III breathalyser. The result from the breath alcohol analysis was reported in BAC, equal to mg of alcohol in 100ml of blood. The Road Traffic legislation in Ireland has a BAC cut-off of 80mg/100ml above which a person is deemed to be at increased risk of impaired driving.

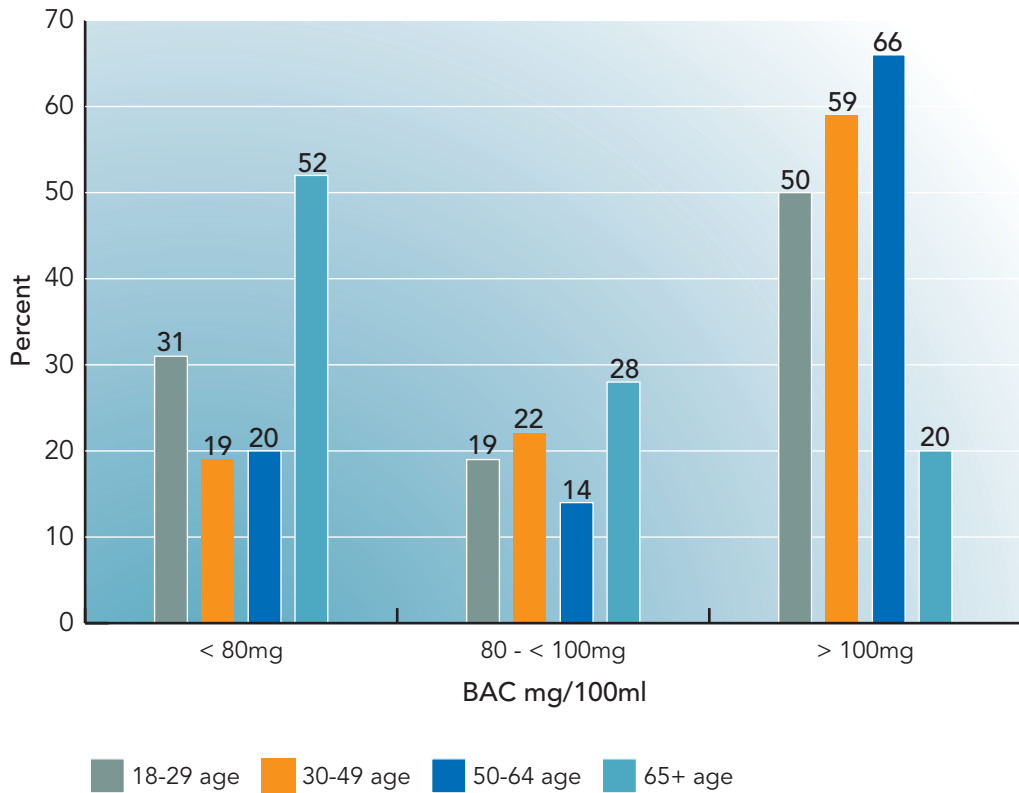
Table 10: BAC for those who reported drinking prior to injury by gender

	Male N=303	Female N=111	Total N=414
BAC	%	%	%
Less than 80mg/100ml	28.4	33.3	29.7*
80–100mg/100ml	19.8	27.9	22.0
100+ mg/100ml	51.8	38.7	48.3

* significant between males and females ($p < .05$)

Of those who consumed alcohol prior to the accident, 70% were over the legal level of BAC for driving (80mg/100ml). Over half of the males had a BAC of 100mg/100ml or higher in comparison to 39% of females (Table 10). Among males, there were significant differences across age groups (Figure 5). A higher proportion of men in the 18 to 64 age groups had a higher BAC level in comparison to older men. The age group with the highest BAC was the 50-64 age group, where 66% had a recorded BAC of 100mg/100ml or higher.

Figure 5: Alcohol-related injuries BAC for males by age group



The state of alcohol intoxication, as clinically assessed, ranged from some alcohol, mild, moderate to severe and very severely intoxicated. Three-quarters (76%) of those attending with alcohol-related injuries were clinically assessed as moderately to severely intoxicated. Comparing patient self-assessment and clinical assessment, patients tended to underestimate their level of drunkenness, especially at the mild to moderate level, and opted to report some alcohol taken (Table 11). However, a significant correlation was observed between clinical assessment and self-assessment of alcohol intoxication (Spearman’s $r=.80$, $p<.001$). Significant correlations were also observed between the recorded BAC of the patient and the clinical assessment of level of alcohol intoxication (Spearman’s $r=.54$; $p<.001$). A similar relationship was also observed between BAC and self-reported intoxication.

Table 11: State of Alcohol Intoxication, Clinical Assessment and Patient Self-Assessment (N=478)

State of Alcohol Intoxication	Clinical Assessment	Patient Self-Assessment
	%	%
Very severely intoxicated	0.4	0.4
Severely intoxicated	25.9	22.2
Moderately intoxicated	50.4	41.4
Mildly intoxicated	19.7	12.6
Some alcohol taken	3.1	20.9
Unknown (Refused to say)	0.4	2.5

3.6.3 Drinking environment prior to injury

Patients presenting with alcohol-related injuries were asked where they were drinking prior to their injury/accident and the venue of their last drink. For the majority (70%) of patients the pub, hotel or other drinking place was the drinking environment prior to their accident (Table 12). Drinking in their own home was reported by just 15% of patients. However, there was some movement from the original drinking environment to the venue of their last drink. The most notable shift was an increase in the numbers reporting nightclub venue for the place of last drink and a smaller increase in the number drinking in someone else's home. This corresponded with a decrease in the numbers reporting the pub as their venue for last drink. However, 60% continued to report the pub as the venue of last drink.

Table 12: Drinking environment prior to sustaining alcohol-related injury (N=478)

Drinking Venues	Place of drinking prior to injury	Place of last drink
	%	%
Pub, hotel, other drinking place	69.5	60.3
Own home	15.3	13.8
Outdoor public place	6.9	6.9
Other home	5.9	9.8
Restaurant serving full meals	0.8	0.2
Nightclub	0.6	8.6
Other	1.0	0.4

The length of time between the last drink and sustaining the injury was within one hour for the majority (70%) of patients, while a further 23% said the injury occurred within two hours of their last drink. Less than 2% had consumed alcohol between the injury event and attendance at the A & E department.

3.7 TYPICAL DRINKING HABITS OF ALL PATIENTS

All patients in the study were asked about their typical drinking habits in the past 12 months, in terms of the frequency of drinking, the quantity of alcohol consumed and the frequency of high risk drinking. Separate tables are presented for patients with non-alcohol-related injuries and alcohol-related injuries.

Overall, 20% of patients with non-alcohol-related injuries were non-drinkers/abstainers, with higher rates among females (35%) than males (20%). The highest abstainer rate was in the 65+ age group (Table 13). Higher rates of abstainers were reported for patients in the Letterkenny Hospital in comparison to other hospital sites.

Table 13: Typical drinking habits: Non-alcohol-related injuries (n=1607)

	N	Non-drinkers %	Drinking every day %	Drinking at least weekly %	Mean no. of drinks usually consumed	Hazardous (5-11) drinking at least weekly	Harmful (12+) drinking at least weekly %
Males							
18-29 yrs	516	16.3	0.8	71.1	14	60.3	11.3
30-49 yrs	318	18.2	2.8	66.6	11	45.0	3.1
50-64 yrs	90	18.9	5.6	65.6	8	28.9	3.3
65+	72	45.9	4.2	36.1	5	4.3	0.0
TOTAL	996	19.3	2.1	66.7	12	48.6	7.2
Females							
18-29 yrs	194	17.0	0.0	60.8	9	45.9	5.2
30-49 yrs	145	28.3	1.4	47.6	6	19.4	1.4
50-64 yrs	110	37.3	3.6	40.0	5	8.1	0.9
65+	151	64.2	3.3	23.2	3	1.3	0.7
Total	600	35.2	1.8	44.3	7	21.4	2.3

Daily drinking was low, but was highest in the 50 to 64 age group for males (6%) and females (4%). Two-thirds of males consumed alcohol weekly with the highest rates in the 18-29 age group (71%) and the lowest in the oldest age group (36%). For females, the highest rate of weekly drinkers (61%) was in the 18-29 age group. The average number of drinks consumed in a typical drinking occasion was 12 drinks for males and 7 drinks for females. However, higher rates were reported for males and females in the 18-29 age groups, 14 drinks and 9 drinks respectively.

Hazardous drinking (5-11 drinks/occ) at least weekly was reported by half of the males and one-fifth of the females. However, within the 18-29 age group, 60% of males and 46% of females reported such hazardous drinking levels. One in ten (11%) males in the 18-29 age group reported drinking at harmful levels (12+ drinks/occ) at least weekly. Among females, the overall rate of harmful drinking was 2%, but was double the rate (5%) among females in the 18-29 age group.

Table 14: Typical drinking habits : Alcohol-related injuries (n=478)

	N	Non-drinkers %	Drinking every day %	Drinking at least weekly %	Mean no of drinks usually consumed	Hazardous (5-11) drinking at least weekly	Harmful (12+) drinking at least weekly %
Males							
18-29 yrs	177	n/a	4.5	88.7	15	84.2	20.3
30-49 yrs	105		24.0	93.2	17	85.7	36.6
50-64 yrs	40		47.5	92.5	14	85.0	45.0
65+	27		25.9	96.3	11	62.9	25.9
TOTAL	349		17.0	91.1	15	83.1	28.4
Females							
18-29 yrs	47	n/a	2.1	85.1	11	76.6	12.7
30-49 yrs	42		11.9	90.5	10	64.3	14.3
50-64 yrs	28		25.0	85.7	12	67.9	25.0
65+	6		16.7	50.0	5	16.7	0.0
Total	123		11.4	85.4	10	67.5	15.4

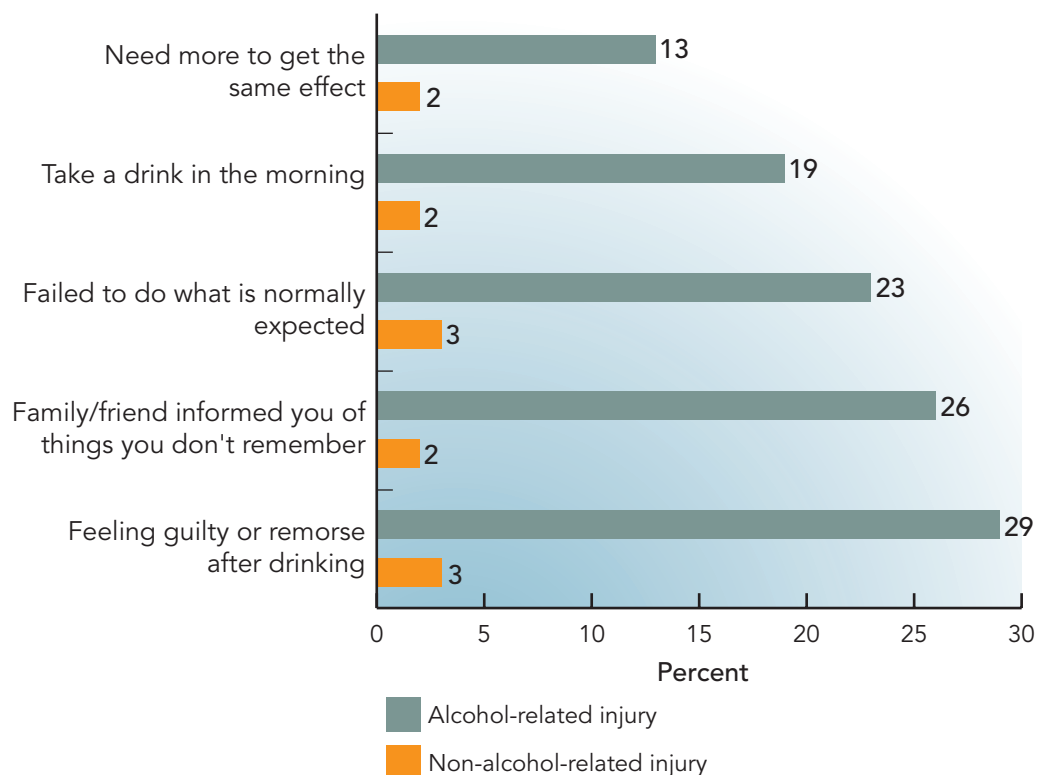
The typical drinking habits among patients presenting with alcohol-related injuries, in comparison to non-alcohol-related injuries, showed higher proportions of males and females, drinking every day, drinking at least weekly, drinking higher quantities of alcohol per occasion and engaged in hazardous and harmful drinking at least weekly (Table 14). The proportion of daily drinkers was highest in the 50 to 64 age group for males and females, 48% and 25% respectively. The average number of drinks typically consumed was highest for males in the 30-49 age group, at 17 drinks per occasion, and was highest for females in the 50-64 age group, at 12 drinks per occasion. The number of patients with alcohol-related injuries drinking at hazardous and harmful levels, at least weekly, was higher among males than females. The 50-64 age groups had the highest proportion of harmful drinking (12+ drinks/occ) for both males and females. The proportion of female patients with alcohol-related injuries drinking at hazardous levels (5-11 drinks/occ) was higher than the proportion of males with non-alcohol-related injuries drinking at such levels (68% vs. 49%). Male patients in the Mater Hospital presenting with alcohol-related injuries had a higher

proportion who drank at harmful levels in comparison to the average (37% vs. 28%). Female patients in Waterford Hospital had lower rates of harmful drinking for both the alcohol and non-alcohol injury groups.

3.8 INDICATORS OF PROBLEMS RELATED TO HARMFUL USE OF ALCOHOL

To assess the extent of problems related to the harmful use of alcohol in the study sample, the RAPS (Rapid Alcohol Problems Screen) four item instrument (remorse, amnesia, performance, starter) was used and a tolerance item for alcohol dependency (need more to get same effect). In all of the items, a significantly higher proportion of patients presenting with alcohol-related injuries screened positive (Figure 6).

Figure 6: Indicators of alcohol problems



Overall, 9% of the total sample scored positive on 2 or more of the RAPS items, with a higher proportion among alcohol-related injuries in comparison to non-alcohol-related injuries (29% vs. 2%). The response to the question, *Do you need to drink more to get the same effect*, indicated that 13% of patients with alcohol-related injuries were alcohol-dependent, in comparison to 2% of patients with non-alcohol-related injuries.

3.9 REPEAT ATTENDANCE AT A & E

To assess the level of repeat usage of the emergency services in Acute Hospitals, patients presenting with injuries were asked if they had attended A & E in the past 12 months. Of the total sample, almost one in five (17%) had attended A & E during the past 12 months. However, there was a significantly higher proportion of repeat attendance among patients presenting with alcohol-related injuries (Table 15).

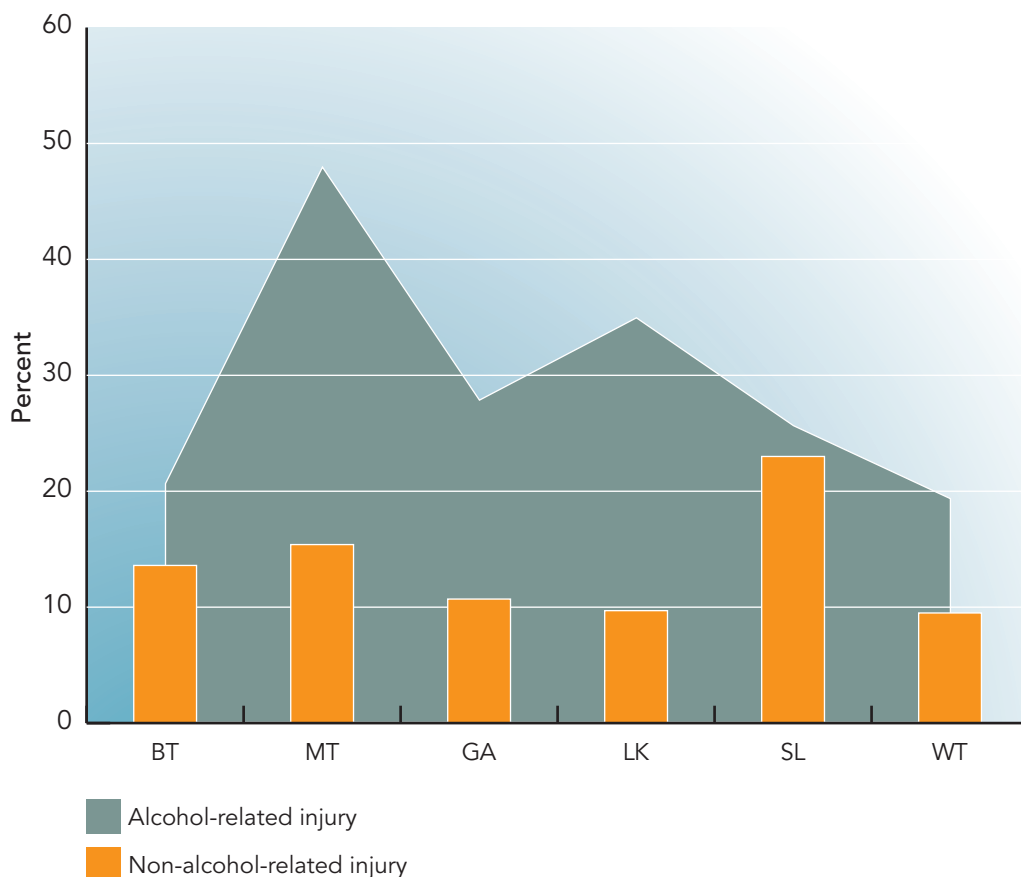
Table 15: Repeat attendance at Accident & Emergency

	Non-alcohol-related injury %	Alcohol-related injury %	Total %
Been in A & E in last 12 months	(n=1595)	(n=478)	
Yes	12.6	32.8	17.3*
No	86.4	64.2	81.3
Can't remember	0.9	2.9	1.4
Visits to A & E in past 12 months	(n=155)	(n=205)	(n=360)
1-2 times	79.5	51.0	67.2*
3-4 times	13.2	28.4	19.7
5+ times	7.3	20.6	13.1

* significant between alcohol and non-alcohol-related groups ($p < .001$)

One in three (33%) of those in attendance for alcohol-related injuries had attended the A & E in the past 12 months, in comparison to about one in ten (13%) among non-alcohol-related injuries. Of those who had attended the A & E, a significantly higher proportion of those presenting with alcohol-related injuries had reported multiple visits to the emergency room. The Mater Hospital had higher rates among those with alcohol-related injuries who had repeat visits to the A & E (Figure 7).

Figure 7: Repeat visits to A & E by hospital location



3.10 MULTIPLE RISK FACTORS FOR ALCOHOL-RELATED INJURIES

A logistic regression model was used to identify the main factors that predicted alcohol-related injury attendance, controlling for demographics, time of presentation, place of injury, drinking patterns and harm indicators. Seven factors significantly predicted alcohol-related injury presentation in the A & E (Box 1). Patients presenting with injuries in the emergency room between midnight and 6am were 16 times more likely to be related to alcohol. Those who typically drank at hazardous levels (5-11 drinks/occ) at least once a month, during the last 12 months, were almost 12 times more likely to present with alcohol-related injuries in the emergency room. Patients who screened positive on the RAPS (Rapid Alcohol Problem Screen) were 7 times more likely to present with alcohol-related injuries. Presentations at the weekend (Sat/Sun) were significantly more likely to be associated with drinking prior to injury. Injuries that occurred on the street or the road were more likely to be alcohol-related. Patients with alcohol-

related injuries were more likely to have lower socio-economic status. The Mater Hospital in Dublin was more likely to have patients in attendance with alcohol-related injuries, in comparison to other hospital sites.

Box 1 Factors predicting alcohol-related injury attendance at A & E:

- *Presentation at A & E between midnight and 6.00am*
- *Hazardous drinking (5-11 drinks/occ) at least monthly*
- *Positive on 2+ of the alcohol problem indicators*
- *Presentation at the weekend (Sat/Sun)*
- *Injured on the street or road*
- *Lower socio-economic status*
- *More likely in the inner city hospital*

3.11 SCREENING TOOL

A discriminate function analysis was undertaken to identify the screening items that maximised the difference between patients with alcohol and non-alcohol-related injuries. Eight variables were included in the discriminate function. Weekly drinking, the two items for frequency of hazardous and harmful use (FQ 5-11 drinks and FQ 12+ drinks), the 4 individual RAPS items (remorse, amnesia, perform, starter) and the alcohol-dependent item (need more for same effect) were entered using a stepwise statistical procedure.

Table 16: Discriminate Function analysis of significant screening items for alcohol-related injuries

Predictor variable	Standardised discriminate function coefficients (order of entry)	Univariate F (1, 2056)	p
Frequency of 5 to 11 drinks/occ	.59 (4)	452.70	.000
Remorse	.37 (1)	326.22	.000
Amnesia	.21 (2)	222.44	.000
Frequency of 12+ drink/occ	.12 (3)	168.27	.000

Canonical R=.50; Eigenvalue =.33; Wilks' Lambda =.75; Chi-square 582.44 (df = 4, p<.001)

The results of the discriminate function revealed that four of the variables significantly maximised group separation between those with alcohol and non-alcohol-related injuries (Table 16). Patients with alcohol-related injuries had a higher frequency of hazardous and harmful drinking occasions and scored higher on the problem indicators of remorse and amnesia than non-alcohol-related injured patients. Significant correlations between the 4 RAPS items were expected and observed in the pooled within-groups correlation matrix in Table 17. The drinking measures were also significantly correlated.

Table 17: Pooled within-groups correlation matrix of screening variables for alcohol and non-alcohol injury group analysis

Predictor variables	Amnesia	Perform	Starter	Need more for effect	FQ 12+ drinks	FQ 5-11 drinks	Weekly drinking
Remorse	.77	.62	.63	.51	.41	.27	.11
Amnesia	-	.70	.62	.59	.43	.27	.09
Perform		-	.65	.63	.40	.29	.11
Starter			-	.70	.42	.27	.08
Need more				-	.38	.24	.07
FQ 12+					-	.55	.32
FQ 5-11						-	.64

Given the results of the discriminate function analysis above, which identified the items that maximised the differences between the two groups, the following proposed screening items are presented (Box 2). Patients presenting who screen positive on two of the (S1-S4) items should be provided with brief intervention.

Box 2: Proposed Screening items

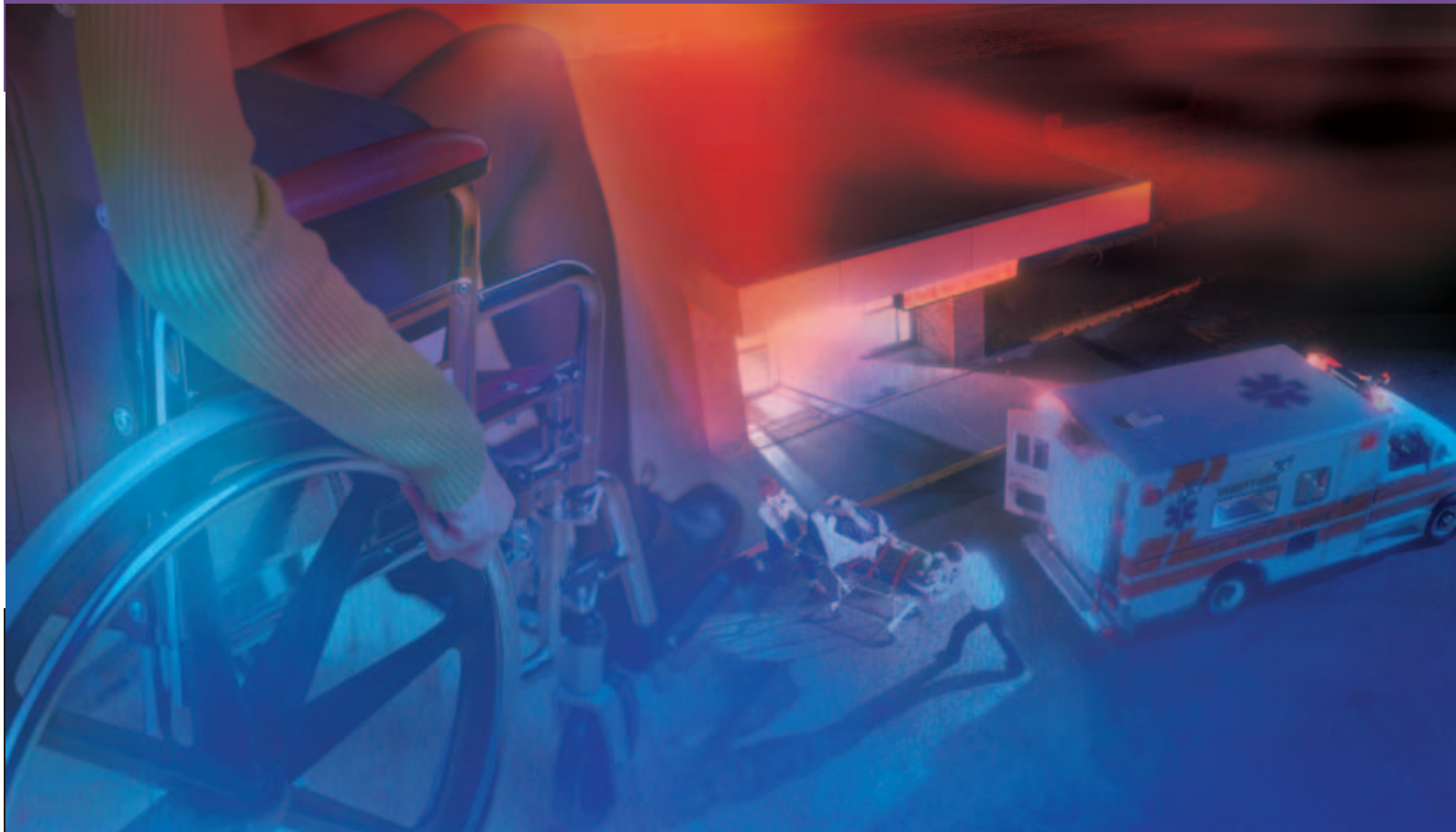
In the past 12 months did you drink alcohol? If yes,

S1. In the past 12 months how often did you drink between 5 and 11 drinks on one occasion?

S2. During the last 12 months, have you had feelings of guilt or remorse after drinking?

S3. During the last 12 months, has a friend or family member ever told you about things you said or did while you were drinking that you could not remember?

S4. In the past 12 months how often did you drink 12 or more drinks on one occasion?



4 Discussion

4. Discussion

The purpose of the study was to examine the role of alcohol and injuries, with a specific focus in the Accident and Emergency (A & E) departments in Acute Hospitals across the country. A second aim was to assess the potential of reducing alcohol-related problems through appropriate Screening and Brief Intervention (SBI) in the emergency room.

It is important to note that the numbers in this study do not reflect all the patients in attendance at the A & E Departments, but is confined to those who were 18 and over, who presented to the A & E with an injury and within 6 hours of that injury/accident event. Overall, the vast majority of those in attendance at A & E with injuries were male and under 50 years of age. Those who reported drinking in the 6 hours prior to the injury event were deemed alcohol-related injuries. Patients presenting with alcohol-related injuries were less likely to be in full-time, paid employment, had lower education and less monthly income in comparison to other injured patients.

4.1 A & E ATTENDANCE

Over one-quarter of patients in attendance at the A & E were related to alcohol. This was primarily as a result of the patient's own drinking prior to the injury event but, in some instances, was caused by a third party, many of whom had consumed alcohol. Comparing alcohol and non-alcohol-related injuries, attendance patterns differed in terms of days of week and times of day. For alcohol-related injuries, attendance was highest on Saturdays and Sundays and the peak-time was between 3am and 4am. In contrast, non-alcohol-related injury attendance had the highest rates on Saturdays and Thursdays, with a peak time between 10pm and 11pm. Combining day and time, patients presenting between midnight to 6am, on six of the seven days of the week (except Wednesday), were more likely to be alcohol-related. The predominance of night-time and weekend presentation for alcohol-related injuries has also been found in other countries (Young et al., 2004). A higher proportion of patients with alcohol-related injuries attended within one hour of the injury/accident event, in comparison to other injured persons who took longer to present at the A & E. This may be due to the fact that the injury events relating to alcohol took place for many in the public domain of the street, road or drinking venue. Emergency services are often called (Gardai and ambulance) to deal with such injury events.

4.2 INJURY AND RELATED EVENTS

The overall top diagnosis, as clinically assessed by staff in the emergency room, was fractures. The highest prevalence of alcohol-related injuries were cuts, bites and penetrating injuries which were at almost twice the rate of non-alcohol-related injuries. Bruises, scrapes and superficial wounds, as well as concussion and closed head injuries, were also more common among those who had consumed alcohol prior to the accident. Overall, the top reported cause of the injury/accident were falls and trips. Those who had consumed alcohol prior to their injury were more likely to have had a blunt force injury (in other words been physically hit) in comparison to patients with other injuries.

While the majority of injuries were unintentional, one in three of alcohol-related injuries, in comparison to one in twenty of non-alcohol-related injuries, were intentional and perpetrated by someone else. A further 6% of those with alcohol-related injuries reported their injury was intentional and self-inflicted. This would suggest parasuicide cases, which supports the alcohol link with suicide found in other studies (NSRF, 2002). Of the injuries that were intentional by someone else, strangers were the main perpetrator of the injury for both groups. Spouse/partner were twice as likely to be the perpetrator of alcohol-related injuries in comparison to other injuries. An association of alcohol with a proportion of domestic violence cases has been found elsewhere (Roizen, 1997). Of those who perpetrated the harm/injury on others, two-thirds of the perpetrators had consumed alcohol. Those with alcohol-related injuries were more likely to experience the harm from another drinker, which is not surprising given that most of these injuries occurred on the street/road or around the drinking venue.

4.3 DRINKING PRIOR TO THE INJURY EVENT

Those who attended A & E with an alcohol-related injury, were asked about the quantity of alcohol consumed 6 hours prior to their accident/injury, their level of intoxication and their drinking environment. Six out of every ten patients presenting with alcohol-related injuries had engaged in harmful drinking (12+ drinks) in the six hours prior to the accident/injury, which was more prevalent among males in comparison to females. A drink is defined as a half pint of beer, a glass of wine or a single measure of spirits and is equivalent to 10 grams of pure alcohol. Prior to the accident/injury, the highest rate of harmful drinking was in the 18-29 age group. Hazardous drinking (5-11 drinks) was evident among females,

with half of them reporting drinking at this level. Two-thirds of those who had alcohol-related injuries reported that the accident/injury would not have happened if they had not been drinking.

Three different measures were used to assess the level of intoxication, blood alcohol concentration, clinical assessment and self-reported drunkenness. Of those who consumed alcohol prior to the accident, 70% were over the legal level for driving ($\geq 80\text{mg}/100\text{ml}$). Two-thirds of males in the 50-64 age group had a recorded BAC of $100\text{mg}/100\text{ml}$ or higher. The state of alcohol intoxication, as clinically assessed, showed that three-quarters of those attending with alcohol-related injuries were moderately to severely intoxicated. Significant correlations were observed between the recorded BAC of the patient, the clinical assessment and self-reported intoxication.

Patients were asked where they were drinking prior to their injury/accident and the venue of their last drink. For the vast majority of patients the pub, hotel or other drinking place was the drinking environment prior to their accident. There was some movement from the original drinking environment to the venue of their last drink. The most notable shift was a small increase in the numbers reporting the nightclub venue for the place of last drink. However, the pub continued to be the venue of last drink for the majority. The length of time between the last drink and sustaining the injury was within one hour for the majority of patients.

4.4 TYPICAL DRINKING PATTERNS

All patients in the study were asked about their typical drinking habits in the past 12 months, in terms of the frequency of drinking, the quantity of alcohol consumed and the frequency of high risk drinking. Among patients presenting with non-alcohol-related injuries, one in five were abstainers with the highest abstention rates in the older age group, which was similar to the national drinking pattern survey (Ramstedt & Hope, 2005). Daily drinking was relatively low but was highest in the 50 to 64 age groups among males and females, which were higher rates than in the national survey. The average number of drinks consumed in a typical drinking occasion was 12 drinks for males and 7 drinks for females. However, higher rates of drinks per occasion were reported for males and females in the 18-29 age group. Hazardous drinking (5-11 drinks/occ) at least once a week, in the past 12 months, was reported by half of the males and one-fifth of the females. The rate of hazardous drinking among females in the younger age group was double that of the female average. Similar high rates of hazardous drinking was found among college female students (Hope et al.,

2005). However, comparison with the national survey on a similar measure (binge drinking at least weekly) and with the same age group (18-29 yrs), showed that almost twice as many females in this hospital sample were drinking at a hazardous level. The opposite was the case for males over 50 years, with lower rates of hazardous drinking in the hospital sample. One in ten males, in the younger age group, reported drinking at harmful levels (12+ drinks/occ) at least weekly. Among females, the overall rate of harmful drinking was low but was highest among females in the 18-29 age group.

The typical drinking habits among patients presenting with alcohol-related injuries showed higher proportions of males and females, drinking every day, drinking at least weekly, drinking higher quantities of alcohol per occasion and engaging in hazardous and harmful drinking at least once a week. The proportion of daily drinkers was highest in the 50 to 64 age group for males and females where almost half of males and one-quarter of females drank daily. The average number of drinks typically consumed per occasion was 15 for males and 10 for females. However, the highest rate of drinks per occasion was found in the male 30-49 age group and in the female 50-64 age group. Drinking at hazardous levels (5-11 drinks/occ) was the norm for males, where four out of five patients drank at such levels at least weekly. Similar rates of hazardous drinking were found among females in the younger age group. For both males and females, the 50-64 age group had the highest proportion drinking at harmful levels (12+ drinks/occ) at least once a week.

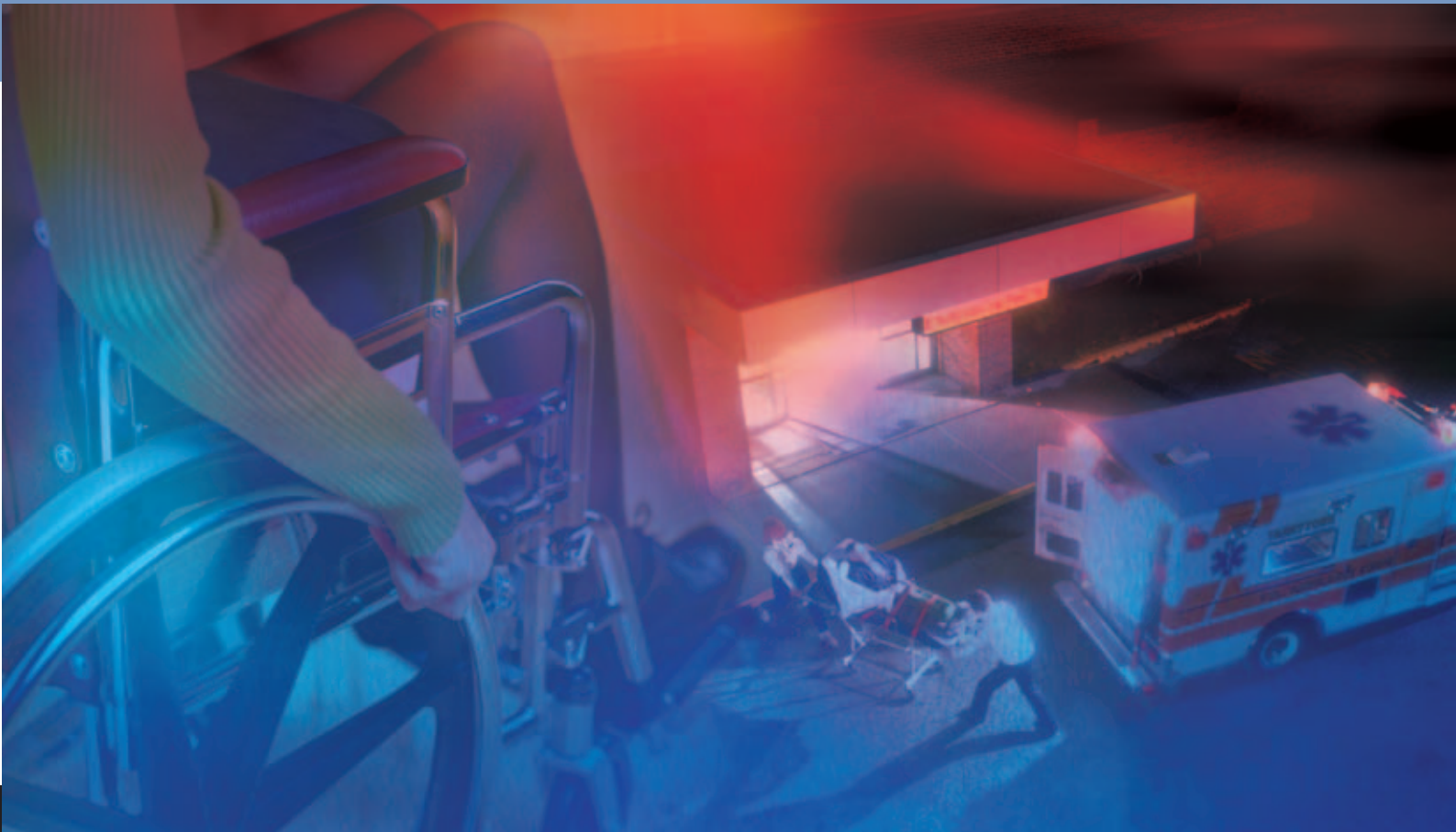
4.5 ALCOHOL-RELATED PROBLEMS

To assess the extent of problems related to the harmful use of alcohol in the study sample, the Rapid Alcohol Problems Screening (RAPS) instrument was used and a measure of alcohol dependency. For all of the items, a significantly higher proportion of patients presenting with alcohol-related injuries screened positive. Nearly one-third of those with alcohol injuries screened positive on two or more of the RAPS measures. Alcohol dependency was identified in approximately one in ten patients with alcohol-related injuries, in comparison to one in fifty of patients with other injuries. These findings suggest that patients who consumed alcohol in the 6 hours prior to injury (alcohol-related injuries) were not confined to alcohol-dependents and included a substantial number of those who drink at hazardous and harmful levels on a regular basis.

Repeat usage of the A & E services in Acute Hospitals was reported by one in three of those in attendance for alcohol-related injuries, in comparison to about one in ten among other patients injured. Alcohol-related injured patients were more likely to report multiple visits to the emergency room. The main factors that predicted attendance at A & E for alcohol-related injuries were time and day of presentation, regular drinking at hazardous levels, screening positive on alcohol problems indicators, place of injury and socio-economic status. Patients presenting with injuries in A & E between midnight and 6am were 16 times more likely to be related to alcohol. Those who typically drank at hazardous levels (5-11 drinks/occ) at least once a month, during the last 12 months, were almost 12 times more likely to present with alcohol-related injuries. Patients who screened positive on problems indicators were 7 times more likely to present with alcohol-related injuries. The weekend (Sat/Sun) was also a more likely time for patients presenting with alcohol injuries, as were injuries that occurred on the street. Patients with alcohol-related injuries were more likely to have lower socio-economic status. The Mater Hospital in Dublin was more likely to have patients in attendance with alcohol-related injuries in comparison to other hospital sites.

4.6 SCREENING TOOL

To identify those who could benefit from brief intervention in A & E, a short and effective screening tool is necessary. Four items significantly maximized group separation between those presenting with alcohol and non-alcohol-related injuries. The items were; frequency of hazardous drinking (5-11 drinks/occ), a positive response to two indicators of harm (remorse and amnesia) and the frequency of harmful drinking (12+ drinks/occ). Patients with alcohol-related injuries had a higher frequency of hazardous and harmful drinking occasions and scored positive on the problem indicators of remorse and amnesia, in comparison to other injured patients. Therefore, these four items are proposed as an effective and short screening tool that could be used in A & E to identify those who could benefit from brief intervention. This screening tool may also have applications in other healthcare settings.



5 Conclusion

5. Conclusion

The findings of this national study confirm that alcohol injuries carry a significant burden for A & E services in Acute Hospitals in Ireland, in terms of increased numbers in attendance, the range of presenting injuries and the high level of repeat visits. The estimate of alcohol-related injuries in this study is a very conservative figure as it excludes those under 18 years and those who delayed their attendance to the hospital. Those who consumed alcohol in the 6 hours prior to the injury event presenting in the A & E, were made up of a relatively small number of alcohol-dependent persons, a large number of those who drink at hazardous and harmful levels, and a small number who experience an injury as a result of someone else's drinking.

Comparing this hospital sample (non-alcohol injuries) with the national survey, similar rates of abstainers, daily drinkers and drinking at hazardous levels, equivalent to binge drinking, was observed in most of the age groups. Noted exceptions were; the higher rates of daily drinking in the 50-64 age group in the hospital sample and the higher levels of hazardous drinking for females under 50 years. Higher levels of hazardous and harmful drinking were found among those presenting with alcohol-related injuries not just prior to the accident/injury event but in their typical drinking patterns. Regular heavy drinking was most evident among the 50-64 age group presenting with alcohol-related injuries. The socio-economic status of those with alcohol-related injuries was lower in comparison to other patients. The Mater Hospital had higher alcohol-related attendance in comparison to other hospitals. This reflects both the patient profile and its location as an inner city hospital with easy access to the city centre. The findings also suggest that the Mater had a higher number of chronic alcohol abusers drinking at harmful level who were likely to present at the A & E more often.

The findings of this study provide valuable evidence in helping to understand the nature and extent of alcohol-related problems in Ireland. While the risk of harm is evident in the current study, there is also a substantially increased risk of alcohol-related problems for many drinking at hazardous and harmful levels, in particular, younger women as reported elsewhere (Hope et al., 2005; Ramstedt & Hope, 2005). There is increased risk for staff working in the A & E departments due to the level of intoxication among patients, which has significant health and safety implications.

The international research evidence illustrates the effectiveness of screening and brief intervention (SBI) in reducing alcohol-related problems. There is a strong case for the development of a national SBI programme in Ireland for A & E Departments in Acute Hospitals throughout the country and in other healthcare settings. The implementation of SBI is an essential policy measure to reduce alcohol-related harm and to reduce the burden on the Irish health services.



6 Recommendations

1. That a national early intervention programme to reduce alcohol-related injuries, involving screening and brief intervention (SBI), be put in place in the emergency room in Acute Hospitals as a matter of urgency. The first phase of which should be the implementation and evaluation of a pilot SBI programme using the short screening tool identified in this study.
2. That a training programme be developed and implemented by the Health Service Executive (HSE) to provide adequate staffing levels for SBI delivery.
3. That ongoing monitoring of the SBI be undertaken to ensure effectiveness and cost-effectiveness in the Irish context.
4. That SBI be considered for other healthcare settings, in particular, primary care and health clinics where harmful alcohol use is a contributory factor in presenting conditions (emergency contraceptive, STI's, parasuicide, mental health).
5. That SBI be integrated with other health services through explicit pathways of care for those requiring treatment services for alcohol-related problems.

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Appendix A

Table A1: Demographics of patients recruited to study by hospital location

	Beaumont		Mater		Galway		Letterkenny		Sligo		Waterford		Total	
No. of patients recruited	484		492		486		202		213		623		2500	
Gender	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
males	60.3 (292)	70.1 (245)	65.2 (317)	65.8 (133)	65.2 (317)	65.8 (133)	62.9 (134)	62.9 (134)	62.9 (134)	65.7 (409)	65.7 (409)	65.2 (1630)	65.2 (1630)	65.2 (1630)
females	39.7 (192)	29.9 (147)	34.8 (169)	34.2 (69)	34.8 (169)	34.2 (69)	37.1 (79)	37.1 (79)	37.1 (79)	34.3 (214)	34.3 (214)	34.8 (870)	34.8 (870)	34.8 (870)
Age group														
18-29 yrs	39.5 (190)	39.5 (193)	52.7 (255)	45.0 (91)	52.7 (255)	45.0 (91)	50.2 (107)	50.2 (107)	50.2 (107)	41.5 (257)	41.5 (257)	43.9 (1093)	43.9 (1093)	43.9 (1093)
30-49 yrs	33.1 (159)	32.9 (161)	26.7 (129)	32.2 (65)	26.7 (129)	32.2 (65)	24.9 (53)	24.9 (53)	24.9 (53)	29.8 (185)	29.8 (185)	30.2 (752)	30.2 (752)	30.2 (752)
50-64 yrs	14.1 (68)	16.2 (79)	11.2 (54)	10.9 (22)	11.2 (54)	10.9 (22)	12.2 (26)	12.2 (26)	12.2 (26)	12.9 (80)	12.9 (80)	13.2 (329)	13.2 (329)	13.2 (329)
65+	13.3 (64)	11.5 (56)	9.5 (46)	11.9 (24)	9.5 (46)	11.9 (24)	12.7 (27)	12.7 (27)	12.7 (27)	15.8 (98)	15.8 (98)	12.7 (315)	12.7 (315)	12.7 (315)
Consent given														
Yes	83.1 (402)	80.9 (398)	84.2 (409)	87.6 (177)	84.2 (409)	87.6 (177)	85.4 (182)	85.4 (182)	85.4 (182)	84.3 (525)	84.3 (525)	83.7 (2093)	83.7 (2093)	83.7 (2093)
No	16.9 (82)	19.1 (94)	15.8 (77)	12.4 (25)	15.8 (77)	12.4 (25)	14.6 (31)	14.6 (31)	14.6 (31)	15.7 (98)	15.7 (98)	16.3 (407)	16.3 (407)	16.3 (407)
Why not consent														
Refused	6.6 (32)	4.3 (21)	5.8 (28)	4.1 (12)	5.8 (28)	4.1 (12)	5.2 (11)	5.2 (11)	5.2 (11)	3.7 (23)	3.7 (23)	5.1 (127)	5.1 (127)	5.1 (127)
Too intoxicated	2.5 (12)	7.5 (37)	3.1 (15)	2.7 (8)	3.1 (15)	2.7 (8)	4.7 (10)	4.7 (10)	4.7 (10)	2.2 (14)	2.2 (14)	3.8 (96)	3.8 (96)	3.8 (96)
Could not locate/left	3.5 (17)	3.8 (19)	4.1 (20)	0.0 (0)	4.1 (20)	0.0 (0)	1.9 (4)	1.9 (4)	1.9 (4)	3.0 (19)	3.0 (19)	3.2 (79)	3.2 (79)	3.2 (79)
Too severely injured	2.3 (11)	1.0 (5)	1.8 (9)	1.4 (4)	1.8 (9)	1.4 (4)	1.9 (4)	1.9 (4)	1.9 (4)	2.1 (13)	2.1 (13)	1.8 (46)	1.8 (46)	1.8 (46)
Other	2.1 (10)	2.4 (12)	1.7 (5)	0.3 (1)	1.7 (5)	0.3 (1)	0.9 (2)	0.9 (2)	0.9 (2)	4.6 (29)	4.6 (29)	2.4 (59)	2.4 (59)	2.4 (59)
Alcohol-related injuries														
Drinking prior to injury	n=63	167	79	43	79	43	43	43	43	83	83	478	478	478
Too drunk	n=12	37	15	8	15	8	8	8	10	14	14	96	96	96
Drinking perpetrator	n=11	18	9	1	9	1	1	1	1	4	4	44	44	44
TOTAL	20.8% n=86/413	51.5% n=222/431	24.4% n=103/421	28.1% n=52/185	24.4% n=103/421	28.1% n=52/185	28.1% n=54/192	28.1% n=54/192	28.1% n=54/192	18.7% n=101/539	18.7% n=101/539	28.3% n=618/2181	28.3% n=618/2181	28.3% n=618/2181
In paid job (30+ hrs)														
Yes	55.9 (224)	46.1 (183)	53.2 (216)	44.1 (78)	53.2 (216)	44.1 (78)	58.8 (107)	58.8 (107)	58.8 (107)	58.3 (306)	58.3 (306)	53.4 (1114)	53.4 (1114)	53.4 (1114)
No	43.9 (176)	52.6 (209)	46.1 (187)	54.8 (97)	46.1 (187)	54.8 (97)	41.2 (75)	41.2 (75)	41.2 (75)	41.3 (217)	41.3 (217)	46.0 (961)	46.0 (961)	46.0 (961)
Refused	0.2 (1)	1.3 (5)	0.7 (3)	1.1 (2)	0.7 (3)	1.1 (2)	0.0 (0)	0.0 (0)	0.0 (0)	0.4 (2)	0.4 (2)	0.6 (13)	0.6 (13)	0.6 (13)
Years of education														
Mean (SD)	13.5 (2.6)	12.6 (2.8)	14.1 (2.7)	13.0 (2.7)	14.1 (2.7)	13.0 (2.7)	13.3 (2.6)	13.3 (2.6)	13.3 (2.6)	13.5 (2.6)	13.5 (2.6)	13.4 (2.7)	13.4 (2.7)	13.4 (2.7)
Monthly income														
Mean (SD)	€1829 (€1201)	€1561 (€889)	€1598 (€763)	€1438 (€829)	€1598 (€763)	€1438 (€829)	€1531 (€828)	€1531 (€828)	€1531 (€828)	€1808 (€929)	€1808 (€929)	€1670 (€949)	€1670 (€949)	€1670 (€949)

Table A2: A & E Attendance and injury event (alcohol-related injuries vs. others) by hospital location

	Beaumont			Mater			Galway			Letterkenny			Sligo			Waterford			Total		
	Injury	Alcohol	Other	Injury	Alcohol	Other	Injury	Alcohol	Other	Injury	Alcohol	Other	Injury	Alcohol	Other	Injury	Alcohol	Other	Injury	Alcohol	Other
Numbers injured	63	338		167	227		79	327		43	134		83	442		478	1607				
Percent within site	15.7	84.3		42.4	57.6		19.5	80.5		24.3	75.7		23.6	76.4		15.8	84.2	22.9	77.1		
Time of presentation	%	%		%	%		%	%		%	%		%	%		%	%	%	%		
Midnight to 6am	68.3	9.2		58.7	11.0		64.6	7.6		67.4	6.7		60.5	6.5		61.4	9.7	62.3	8.8		
Weekend (Sat/Sun)	61.9	35.8		56.3	20.7		46.8	33.6		74.4	38.8		62.8	38.1		49.4	34.4	56.5	33.3		
Clinical Ass. of injury																					
Fracture	39.7	49.1		25.7	35.7		30.4	39.8		23.3	58.2		41.9	48.9		25.3	52.0	29.5	46.9		
Cut, bite, penetrating injury, open wound	30.2	24.6		43.7	26.9		43.0	23.9		51.2	14.9		32.6	25.9		48.2	21.5	42.3	23.2		
Strain, sprain, dislocation	11.1	19.5		10.2	24.2		13.9	24.5		14.0	17.9		14.0	16.5		12.0	16.5	11.9	20.0		
Bruise, superficial wound	7.9	3.6		12.0	8.8		11.4	7.6		7.0	3.0		9.3	5.8		7.2	6.3	9.8	6.0		
Concussion, closed head injury	9.5	1.2		7.8	3.1		0.0	2.4		2.3	4.5		2.3	1.4		7.2	2.9	5.6	2.5		
Cause of injury																					
Fall, trip	50.8	40.9		43.1	48.0		35.4	35.8		32.6	44.0		34.9	25.9		44.6	38.0	41.4	39.0		
Struck against, caught between	27.0	27.0		24.0	17.6		30.4	22.9		34.9	26.1		14.0	22.3		10.8	24.0	23.2	23.5		
Stab, cut, bite	7.9	16.0		11.4	15.0		19.0	16.2		18.6	11.2		9.3	19.4		20.5	15.8	14.2	15.8		
Blunt force injury	12.7	3.6		16.8	12.8		5.1	11.3		2.3	0.7		30.2	18.7		18.1	9.5	14.4	9.2		
Driver RTA	0.0	6.8		0.6	2.2		5.1	5.8		2.3	9.7		2.3	8.6		1.2	7.0	1.7	6.4		
Passenger RTA	0.0	1.5		1.2	2.2		3.8	3.1		7.0	4.5		7.0	2.2		0.0	2.5	2.3	2.5		
Pedestrian RTA	0.0	0.9		2.4	0.9		1.3	1.5		0.0	0.7		2.3	1.4		2.4	0.9	1.7	1.1		
Why were you injured																					
Unintentional	61.9	94.1		55.1	83.7		62.0	95.7		51.2	95.5		65.1	97.8		59.0	97.3	58.4	94.3		
Intentional self-inflicted	6.3	0.6		6.6	1.3		6.3	0.3		7.0	0.7		0.0	0.0		7.2	0.7	6.1	0.6		
Intentional by someone else	31.7	5.3		37.7	15.0		31.6	4.0		41.9	3.7		34.9	2.2		32.5	2.0	35.1	5.1		
Place of injury																					
Street/Road	44.4	30.2		56.3	36.1		51.3	26.6		51.2	29.9		46.5	25.9		48.2	20.6	51.2	27.3		
Own home	25.4	26.9		13.8	28.6		19.2	21.1		18.6	27.6		14.0	25.2		16.9	23.8	17.2	25.0		
Pub or other drinking venue	19.0	0.3		23.4	0.9		25.6	3.7		23.3	1.5		27.9	0.7		25.3	0.7	23.9	1.3		

Table A3: Drinking pattern and drinking environment prior to alcohol-related injury (n=478) by hospital location

	Beaumont N=63	Mater N=167	Galway N=79	Letterkenny N=43	Sligo N=43	Waterford N=83	Total N=478
No. reported alcohol use							
Drinking prior to injury %	%	%	%	%	%	%	
1-4 drinks	3.3	4.9	11.4	18.6	7.1	4.9	7.2
5-11 drinks	32.8	33.1	27.8	34.9	19.0	37.8	31.9
12+ drinks	63.9	62.0	60.8	46.5	73.8	57.3	60.9
Level of intoxication							
Blood alcohol concentration							
<80mg/100ml	16.0	33.6	34.8	25.0	36.6	25.3	29.7
80-100mg/100ml	30.0	13.7	21.2	25.0	19.5	33.3	22.0
≥100mg/100ml	54.0	52.7	43.9	50.0	43.9	41.3	48.3
Clinical assessment of intoxication							
Some alcohol taken	0.0	2.4	5.0	7.0	4.7	4.8	3.5
Mildly intoxicated	15.9	16.8	30.4	14.0	25.6	18.1	19.7
Moderately intoxicated	47.6	46.1	55.7	69.8	58.1	42.2	50.4
Severely intoxicated	36.5	34.1	8.9	9.3	11.6	33.7	25.9
Very severely intoxicated	0.0	0.6	0.0	0.0	0.0	1.2	0.4
Drinking venue*							
Pub or other drinking place	57.1	65.9	72.2	79.1	76.7	74.7	69.5
Own home	27.0	13.8	15.2	14.0	9.3	13.3	15.3
Outdoor public place	4.8	12.6	6.3	2.3	0.0	3.6	6.9
Other home	7.9	6.0	6.3	2.3	7.0	4.8	5.9
Restaurant serving full meals	3.2	0.0	0.0	0.0	2.3	1.2	0.8
Nightclub	0.0	1.2	0.0	0.0	2.3	0.0	0.6
Place of last drink*							
Pub or other drinking place	41.3	61.1	60.8	79.1	58.1	63.9	60.3
Own home	20.6	13.2	15.2	11.6	7.0	13.3	13.8
Outdoor public place	4.8	12.0	6.3	2.3	0.0	4.8	6.9
Other home	14.3	9.0	11.4	4.7	11.6	8.4	9.8
Nightclub	17.5	4.8	6.3	0.0	23.3	8.4	8.6

* category 'other' not included, therefore some columns do not add to 100%

Table A4: Typical Drinking Habits of all patients presenting with injury (alcohol-related injuries vs. others) by hospital location

	Beaumont		Mater		Galway		Letterkenny		Sligo		Waterford		Total	
	Injury	Other	Injury	Other	Injury	Other	Injury	Other	Injury	Other	Injury	Other	Injury	Other
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Typical drinking habits														
Non-drinkers														
male	-	14.6	-	25.0	-	17.9	-	32.5	-	16.3	-	18.2	-	19.4
female	-	35.7	-	33.3	-	28.1	-	48.1	-	33.9	-	39.1	-	35.6
Drinking every day														
male	11.6	1.0	30.0	3.5	15.3	3.8	6.1	1.3	1.3	7.3	1.7	16.7	2.1	2.1
female	20.0	1.4	13.5	1.2	10.0	2.6	20.0	0.0	3.4	0.0	1.9	11.2	1.8	1.8
Drinking at least once a week														
male	88.4	70.7	93.7	59.0	89.8	74.1	93.3	57.5	90.9	62.5	87.3	65.3	91.1	66.5
female	90.0	46.4	88.6	49.4	95.0	54.4	80.0	33.3	90.0	35.6	71.4	38.5	85.4	44.0
Mean number of drinks														
male	13	12	16	12	16	12	12	12	15	13	16	12	15	12
female	14	6	12	7	9	8	9	7	11	7	7	6	10	7
Hazardous drinking (5-11 drink/occ at least weekly)														
male	76.7	55.1	85.9	40.6	76.3	53.3	84.4	37.5	87.9	46.3	83.6	48.1	82.9	48.5
female	85.0	19.4	68.6	20.5	70.0	33.3	70.0	16.7	60.0	24.6	53.6	14.7	67.5	21.2
Harmful drinking (12+ drinks/occ at least wkly)														
male	20.9	9.1	37.0	8.0	30.5	6.1	25.0	2.5	18.2	7.5	20.0	7.4	28.4	7.2
female	25.0	4.3	22.9	3.6	10.0	3.5	10.0	0.0	20.0	1.8	3.6	0.0	15.4	2.3
Alcohol problem indicators														
RAPS – screened positive														
Remorse	30.2	2.7	37.7	4.5	22.8	3.7	34.9	0.0	7.0	1.4	24.1	1.8	28.9	2.6
Amnesia	30.2	1.5	33.5	5.0	20.3	2.8	25.6	0.0	11.6	1.4	20.5	1.6	25.9	2.1
Perform	20.6	3.6	31.7	5.9	20.3	4.0	27.9	0.7	11.6	2.2	13.3	2.0	23.0	3.2
Starter	15.9	1.5	28.7	5.0	15.2	2.1	23.3	0.0	4.7	2.2	10.8	0.9	19.0	1.9
Alcohol dependency	15.9	2.4	16.6	2.3	10.1	1.8	19.5	0.0	2.3	2.2	10.8	0.7	13.3	1.6
Repeat visits at A & E														
Been in A & E in last year	20.6	13.6	47.9	15.4	27.8	10.7	34.9	9.7	25.6	23.0	19.3	9.5	32.8	12.6

