



Use of alcohol intoxication codes for serious non-fatal hospitalised injury

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ABSTRACT

Aim: To determine the extent to which ICD-10 alcohol intoxication codes are used for serious hospitalised injury and the distribution of these codes according to gender, age, injury mechanism and intent, severity of injury, and whether the patient was treated in an Intensive Care Unit.

Design: Cross-sectional study.

Setting: New Zealand.

Participants: All injury hospital discharges in 2010 that met specified severity criteria.

Measurements: Cases which had a measurement of BAC (Y90) coded, or only a subjective assessment of alcohol intoxication (F10.0).

Findings: 2.5% had a blood alcohol recorded (Y90) and a further 3% were coded as being intoxicated but there was no blood alcohol code. All factors investigated were shown to be independently associated with the assignment of codes. Notable findings were the elevated odds of an alcohol code for males, assault and the more severe injuries.

Conclusions: Assessment of alcohol intoxication among seriously injured persons appears to be very uncommon. The development of a standardised instrument for clinical judgement of intoxication would be highly desirable.

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Introduction

Alcohol has been described as “the AIDS of injury control” because it “lowers the defenses and immunity to injury”.¹ For many injury types, the relationship between blood alcohol content and injury incidence is approximately exponential.² Known within the injury control field as “the ubiquitous risk factor”, hazardous alcohol consumption is the primary cause of serious injury.³ The misuse of alcohol is widely acknowledged as a major social and health problem in New Zealand (NZ)⁴ and many other countries.⁵ It has been argued “The ability to monitor rates of serious alcohol-related harms in the population, both across time and place, is an essential cornerstone of any comprehensive policy to address these harms”.^{6(p147)}

The International Guide for Monitoring Alcohol Consumption and Related Harm argues that there are major challenges to using official statistics to derive direct indicators of alcohol-related harm as, even under ideal conditions, where systems make provision for the assessment of alcohol intoxication, the information is recorded incompletely and inconsistently.⁷ The report recommends a number of solutions to this problem. We have critiqued these solutions and

concluded that the direct method of determining alcohol involvement for important injuries offers the best way forward. By important injuries we mean those that represent a high threat to life, or pose a serious threat of disability, or are high cost.⁸

Room has argued that the routine measurement of blood alcohol concentration (BAC) in the motor vehicle traffic field “... transformed our understanding of the relation between drinking and driving casualties, and also transformed the political situation, buttressing the political will to undertake effective counter-measures.” (p142).⁹ He suggests this provides a strong reason for measuring BAC in emergency room (ER) settings for all injury cases, or if this is not possible then on the basis of systematic sampling. We do not support Room’s approach as many injuries resulting in attendance at an ER are not important, as broadly defined above, and as such the cost of collecting this information is likely to outweigh the benefits.

The release of the 10th revision of the International Classification of Diseases (ICD-10), in 1992, provided for the first time a mechanism for recording the degree of alcohol intoxication for injury cases recorded in official health databases by providing codes for BAC and subjective assessment.¹⁰

The first step in promoting the measurement of alcohol intoxication for important injury is to gain insight into current practice. We sought to determine: (1) the extent to which ICD-10

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alcohol intoxication codes were used in 2010 for serious hospitalised injury in New Zealand, (2) the distribution of ICD-10 alcohol intoxication codes according to gender, age, injury mechanism and intent, severity of injury, and whether the patient was treated in an Intensive Care Unit (ICU).

Methods

Chapter XX of ICD-10, i.e. *External causes of morbidity and mortality* (V01–Y98), provides two supplementary codes for recording alcohol intoxication. The first of these, Y90, has 10 sub-codes that define the level of blood alcohol (e.g. Y90.3 Blood alcohol level of 60–79 mg/100 ml). The second, Y91, records subjective “evidence of alcohol involvement determined by the level of intoxication” (e.g. Y91.3 Very severe alcohol intoxication). In addition, within Chapter V *Mental and behavioural disorders* (F00–F99) additional codes are available for the recording the type of alcohol involvement. Of interest for the current investigation was “F10.0 – Mental and behavioural disorders due to use of alcohol: acute intoxication”.

In 2008 New Zealand adopted the 6th edition of the Australian Modification of ICD-10 (ICD-10-AM-6).¹¹ The Australian Coding Standard¹² for recording alcohol involvement are as follows:

“If the clinical notes include documentation of the blood alcohol level, then a code from Y90 can be assigned, but only when a code of intoxication (F10.0), harmful use (F10.1) or dependence syndrome (F10.2) is applicable in the case being coded.” In addition it was advised: “Y91 Evidence of alcohol involvement determined by level of intoxication should not be used for inpatient morbidity coding.” (p117).

We identified all discharges from public hospitals in New Zealand in 2010 (popn: 4.5 m) where the person had an injury (a diagnosis in the range S00–T78) recorded as their principal diagnosis. In New Zealand, public hospitals provide nearly all hospital treatment in the acute phase for injury.¹³ Persons are required by the Ministry of Health to be classified as admissions if they receive assessment and/or treatment in hospital for three hours or more. This also applies to users of the Emergency Department (page 1).¹⁴ Readmissions for the same injury were excluded according to the method described by Davie and others.¹⁵

Where the principal diagnosis is an injury, hospitals are required to identify the external cause of that injury by assigning a code from Chapter XX of ICD-10-AM. These codes provide the means to identify intent and mechanism of injury using the external cause of injury mortality matrix.¹⁶

For the purposes of this investigation serious injury was defined as that representing a threat of death of 6% or more as estimated by the International Classification of Diseases Injury Severity Score (ICISS).¹⁷ This is consistent with the serious non-fatal injury outcome indicators for the period 2006–2011, developed for the New Zealand Injury Prevention Strategy.¹⁸ ICISS is calculated from empirically estimated diagnosis specific survival probabilities (DSP) for individual injury ICD-10 codes. It is thus ideally suited to deriving severity scores where large administrative datasets are involved, such as here. The DSP is simply the proportion of patients admitted to hospital with a specific injury code who survived in a reference population. The ICISS score for an individual case is calculated as the product of each DSP corresponding to the patient's injuries. We disaggregated the ICISS scores (Table 1) according to the categories used by Gedeberg et al.¹⁹ Cut-offs for the categories were those selected by Gedeberg and others with the aim of minimising the difference in mortality risk within categories and maximising the change in mortality risk between categories.¹⁹ In order to avoid confusion between our use of the term serious and that by Gedeberg we have labelled his severity categories 1 (lowest) to 4 (highest). It is important to note that this

Table 1

Distribution of serious injury cases and those with alcohol codes assigned.

	Total serious cases	Serious cases assigned Y90 ^a		Serious cases assigned F10.0 only	
		n	%	n	%
All	10,394	260	2.5	308	3.0
Gender					
Male	5524	206	3.7	262	4.7
Female	4870	54	1.1	46	0.9
Age					
0–14 years	730	1	0.1	2	0.3
15–24 years	1529	92	6.0	108	7.1
25–34 years	870	47	5.4	57	6.6
35–49 years	1371	77	5.6	78	5.7
50–64 years	1261	31	2.5	43	3.4
65+ years	4633	12	0.3	20	0.4
Intent					
Unintentional	9030	161	1.8	176	1.9
Self-inflicted	313	14	4.5	9	2.9
Assault	1007	83	8.2	119	11.8
Undetermined	33	0	0.0	4	12.1
Other	11	2	18.2	0	0.0
Mechanism					
Caught between	21	0	0.0	0	0.0
Cut/pierce	188	13	6.9	20	10.6
Drowning/submersion	21	2	9.5	2	9.5
Fall	5244	71	1.4	69	1.3
Fire/burn	294	3	1.0	7	2.4
Firearm	14	2	14.3	0	0.0
Foreign body	19	0	0.0	0	0.0
Machinery	33	0	0.0	0	0.0
Motor vehicle traffic	1690	66	3.9	69	4.1
Natural/environmental	153	0	0.0	5	3.3
Other land transport	434	8	1.8	8	1.8
Other transport	73	0	0.0	0	0.0
Overexertion	68	0	0.0	0	0.0
Pedal cyclist, other	307	4	1.3	12	3.9
Pedestrian, other	56	0	0.0	1	1.8
Poisoning	262	6	2.3	2	0.8
Struck by, against	1049	71	6.8	84	8.0
Suffocation	131	6	4.6	4	3.1
Other specified	73	1	1.4	0	0.0
Other specified, not elsewhere classified	32	0	0.0	2	6.3
Unspecified	232	7	3.0	23	9.9
Severity (ICISS)					
1 (0.665–0.940)	9672	210	2.2	264	2.7
2 (0.355–0.664)	619	41	6.6	35	5.7
3 (0.220–0.354)	72	6	8.3	8	11.1
4 (0–0.219)	31	3	9.7	1	3.2
Treated in Intensive Care Unit					
No	10,269	258	2.5	295	2.9
Yes	125	4	3.2	13	10.4

^a 238 also had an F10.0 code.

is a ranking of injuries which collectively are considered serious in that they represent a threat to life of threat of death of 6% or more.

We identified cases: (1) which had a measurement of BAC (Y90) coded, (2) cases with only a subjective assessment of alcohol intoxication (F10.0 only). Logistic regression was conducted to identify variables that were independently associated with these outcomes. Cases for which the intent of the injury was undetermined or recorded as “other” (e.g. legal intervention) were excluded from the logistic regression.

Results

There were 84,601 injury discharges in 2010 of which 10,394 (12.3%) met our case definition of serious non-fatal injury, namely

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