



injury prevention research unit

Developing valid indicators for alcohol- related injury in New Zealand: A review of existing indicators

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**Developing valid indicators for alcohol-related
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indicators**

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Executive Summary

Background and Aims

Following the June 2003 release of the New Zealand Injury Prevention Strategy (NZIPS), the secretariat of NZIPS commissioned work to develop injury outcome indicators that focus on 'all injury' as well as the six priority areas identified in the NZIPS, namely: assault, work-related injury, intentional self-harm, falls, motor vehicle traffic crashes (MVTCS), and drowning. Since the release of the report describing this work there have been calls for additional indicators, including alcohol-related injury outcome indicators. As part of the process of considering potential indicators we undertook a critical appraisal of existing New Zealand indicators for monitoring alcohol-related injury.

Methods

During 2005 we approached the following government agencies for details on any indicators they use for measuring alcohol-related injury:

- Accident Compensation Corporation (ACC)
- Alcohol Advisory Council of New Zealand (ALAC)
- Maritime New Zealand (MNZ)
- Ministry of Health (MoH)
- Ministry of Justice (MoJ)
- New Zealand Police (NZP)
- Ministry of Transport (MoT)
- Water Safety New Zealand (WSNZ)

Our assessment of existing indicators was guided by the criteria used in developing the existing NZIPS indicators.

Findings

ACC, ALAC, MoH, MoJ, NZP, and WSNZ, do not have any official national indicators of alcohol-related injury.

MNZ has one alcohol-related indicator, namely: Proportion of fatalities [involving a ship / vessel] with alcohol as contributing factor, for both commercial and recreational activity.

MNZ report that they have focused on alcohol over the past few years so there is likely to be increasing attention to this matter by investigators. This coupled with significant under-reporting suggests that indicators based on their own investigative data are likely to show biased trends and so cannot be used as a reliable indicator for tracking alcohol-related injury over time.

The *MoT* national road safety alcohol-related injury indicators are:

- 1) Numbers of drivers killed with excess alcohol
- 2) Proportion of drivers killed with excess alcohol
- 3) Proportion of fatal crashes with driver alcohol as a contributor

A potential threat to validity of all three *MoT* indicators is variability in the reasons for not testing for alcohol over time.

Conclusion

The absence of existing alcohol injury indicators in most areas is of concern given the mandate of the various agencies we contacted and successive recent governments becoming increasingly outcome focused. Of the indicators identified, those of the *MoT* satisfy most of our assessment criteria; however a significant threat to validity is posed by the variability in testing rates over time. This issue warrants further investigation to determine if there are biases associated with this variability and thus for indicators based on alcohol testing results.

1. Introduction

Following the June 2003 release of the New Zealand Injury Prevention Strategy (NZIPS) (<http://www.nzips.govt.nz/>), the secretariat of NZIPS commissioned work to develop injury outcome indicators that focus on ‘all injury’ as well as the six priority areas identified in the NZIPS, namely: assault, work-related injury, intentional self-harm, falls, motor vehicle traffic crashes (MVTCS), and drowning ^{1 2}. Since the release of the report describing this work there have been calls for additional indicators, including alcohol-related injury outcome indicators. Such calls are justified since alcohol is a major risk factor for many different types of injury events ³. In addition, it was recently estimated that injury is responsible for 51% of all alcohol-related deaths, and 72% of years of life lost in New Zealand (NZ) ⁴. As part of the process of considering the potential indicators, we undertook a critical appraisal of existing indicators for monitoring alcohol-related injury in NZ.

2. Method

During 2005 we approached the following government agencies for details on any indicators they use for measuring alcohol-related injury:

- Accident Compensation Corporation (ACC)
- Alcohol Advisory Council of New Zealand (ALAC)
- Maritime New Zealand (MNZ)
- Ministry of Health (MoH)
- Ministry of Justice (MoJ)
- New Zealand Police (NZP)
- Ministry of Transport (MoT)
- Water Safety New Zealand (WSNZ)

The agencies were selected on the basis that injury prevention and/or reducing hazardous alcohol consumption were, or should be, a key organisational concern. The latter judgement was based on the alcohol attributable fraction (AAF) for various mechanisms of injury ³. These are presented in Table 1.

Table 1. Global alcohol-attributable fractions for injury

	15-29 yrs		30-44 yrs		45-59yrs	
	Female	Male	Female	Male	Female	Male
Traffic crashes	.09	.32	.14	.36	.12	.09
Poisoning	.16	.26	.11	.15	.12	.16
Falls	.10	.20	.10	.21	.11	.21
Drowning	.18	.24	.23	.29	.24	.29
Other unintentional	.16	.26	.17	.27	.15	.23
Homicide	.19	.25	.20	.25	.21	.26
Other intentional	.14	.19	.15	.19	.16	.20

Source: Rehm J, Room R, Graham K, et al: The relationship of average volume of alcohol consumption and patterns of drinking to burden of disease: an overview. *Addiction* 98:1209-28, 2003

Our assessment of existing indicators was guided by the criteria used in developing the existing NZIPS indicators. The criteria used for validating injury indicators were those that were agreed at a meeting of the International Collaborative Effort on Injury Statistics (ICE) in 2001. The criteria suggest that an ideal indicator should:¹⁷

- Have a case definition based on diagnosis – on anatomical or physiological damage
- Focus on serious injury
- Have, as far as possible, unbiased case ascertainment
- Be derived from data that are representative of the target population
- Be based on existing data systems (or it should be practical to develop new data systems)
- Be fully specified

These criteria were developed solely in the context of indicators of injury incidence and, within that, on the characteristics of the incident cases. It was further agreed at the 2001 ICE meeting that the fewer criteria that are satisfied, the more likely it is that the indicator will be vulnerable to various threats to validity. Since the 2001 ICE meeting, additional criteria have been suggested, namely:¹³

- Completeness and accuracy of source data
- Timeliness
- Ability to measure change over time
- Measurement that is practicable
- Readily comprehensible

A number of the original and the additional criteria, are, strictly speaking, not criteria for validity, however, collectively they represent a good basis for assessing the suitability of existing and potential injury indicators.

3. Results

ACC, ALAC, MoH, MoJ, NZP, and WSNZ, reported that they do not have any official national indicators of alcohol-related injury.

Maritime New Zealand

MNZ has one alcohol-related indicator, namely: Proportion of fatalities with alcohol as a contributing factor, for both commercial and recreational activity. Historically, MNZ has sought to determine the role of alcohol in all *accidents* and *incidents* involving a ship in NZ. Accidents and incidents are defined in the Maritime Transport Act 1994. Accidents involve a wide range of events including those in which someone is seriously harmed (defined in the Health and Safety in Employment Act 1992) and others where there is significant damage or structural failure to the ship (defined in the Maritime Transport Act 1994). An incident is defined as "...any occurrence, other than an 'accident', that is associated with the operation of a ship and affects or could affect the safety of operation" (Maritime Transport Act 1994). The term ship has broad interpretation and includes vessels such as dinghies and kayaks. Skippers are responsible for reporting accidents and incidents. MNZ believe there is significant under-reporting especially of the latter. All accidents used to be investigated by MNZ inspectors but starting in 2005, a tiered investigation system has been introduced so only the more significant accidents (i.e Class A¹) get fully investigated while others are self-investigated. The role of alcohol in Class A accidents is assessed through two different processes, one of which involves the inspector investigating the accident determining whether alcohol use was a causal factor in the accident occurring. Witness statements are used as the primary criteria for determining involvement. For events that involve a fatality, in addition to the above process, the Coronial file is also reviewed by MNZ staff to determine the role of alcohol.

¹ Class A accidents include : a serious harm injury (including fatality), considerable damage to vessel or its machinery, significant pollution, or a significant incident which could have impacted on the safety of the vessel or personnel

Class B accidents include: minor injury, structural damage not affecting sea worthiness, near misses, or other accidents which are potentially serious but do not warrant investigation.

MNZ report that they have focused on alcohol over the past few years so there is likely to be increasing attention to this matter by investigators over time. This coupled with significant under-reporting suggests that indicators based on their own investigative data are likely to show biased trends and so cannot be used as a reliable indicator for tracking alcohol-related injury over time.

Ministry of Transport

The MoT national road safety alcohol-related injury indicators are:

- 1) Numbers of drivers killed with excess alcohol
- 2) Proportion of drivers killed with excess alcohol
- 3) Proportion of fatal crashes with driver alcohol as contributor

There are no national non-fatal injury indicators.

The indicators are derived irrespective of fault. Excess alcohol is defined as blood alcohol over the legal limit (30 mg/100ml for those under 20 years of age and 80mg/100ml for others). To be registered as a fatality, death has to have occurred within 30 days of the crash.

It should be noted that the indicators are estimates, given that blood alcohols are not obtained for all drivers. The method for deriving the estimates is described as follows: *“An estimate of the number of untested drivers who may have been above the legal limit can be made by assuming that the alcohol involvement rate for untested drivers with 'alcohol suspected' is the same as that for the tested drivers with 'alcohol suspected' and similarly for drivers with 'alcohol not suspected'.”*

(p40)⁵

Statistics published by the MoT for the period 1987-2004⁵ show that the proportion of testing of drivers for alcohol has ranged from a low of 67% in 1992 to high of 81% in 2002. A potential threat to validity of all three MoT indicators is variability in the testing over time and the reasons for not testing. For example, it may be that the characteristics of the untested drivers vary over time. There could be a significant variability over time in the proportion of drivers involved in single vehicle night-time crashes that were tested. If that were the case and given that alcohol involvement is related to crash type, the indicators based on these data could be biased. There are uncertainties regarding the validity of indicators based on these data, and until these are removed, the indicators cannot be regarded as valid.

For deaths, it is at the Coroner's discretion as to whether they direct a postmortem blood sample to be taken. Neither the NZ Police or the MoT were able to advise why some blood samples are not requested. Historically there have been approximately 70 Coroners in NZ who operate independently and there is no centralized database that records their activity at this level of detail (Law Commission, 2000). As a consequence we have been unable to readily obtain further insight into any biases that may be associated with the variable proportion of drivers tested.

4. Discussion

The absence of existing alcohol injury indicators reported by most government agencies is of concern given the mandate of the various agencies we contacted and that successive recent governments have become increasingly outcome focused. Of the indicators identified, those of the MoT satisfy most of our assessment criteria, however, a significant threat to validity is posed by the variability in testing rates over time. This issue warrants further investigation to determine if this variability biases indicators derived from alcohol testing data.

Some would argue that a poor indicator is better than no indicator. We strongly disagree. A poor indicator could be worse than no indicator to the degree that it has potential to seriously mislead and may, for example, result in inappropriate allocation of limited prevention resources.

Considerable interest was expressed by a number of agencies in the development of valid indicators, and a number expressed the hope that the recently introduced NZP Alco-Link project could provide the basis for such an indicator. Alco-Link is an intelligence tool that NZP use to help understand the relationship between alcohol and offending, and to identify patterns in the locations where people are drinking before committing an offence. This information is used by Police and partner agencies to target interventions. For example, a particular licensed premise might be consistently identified as the place of last drink for offenders. Police might then use this information to increase monitoring in and around the premises, or to educate the licensee in host responsibility policies and procedures. While such a project will probably be useful for police intelligence, considerable investigative work will need to be undertaken to determine if it could serve as the basis for an indicator of, say,

alcohol-related assault. Major threats to validity would include changes over time in: the number of police on duty and their focus on alcohol-related incidents (e.g., blitzes on late night disorderly and drunken behaviour), the public's perception of the significance of specific events, the ability of the police to do anything about incidents, and the accuracy of recording alcohol involvement.

The most comprehensive documentation on developing indicators of alcohol-related harm is the WHO report: International Guide For Monitoring Alcohol Consumption and Related Harm ⁶. This report, produced by an international group of alcohol researchers under the auspices of the WHO, offers guidance in the measurement of levels and patterns of alcohol consumption, and in the use of various official data representing acute alcohol-related harms attributable to episodic heavy drinking (e.g., injury), and chronic harms caused by prolonged heavy drinking (e.g., liver cirrhosis). MACRH has a substantial section entitled "Measures and indicators of alcohol-related harms" in which it is pointed out that there are major challenges to using official statistics to derive direct indicators of alcohol-related harm, since even under ideal conditions, where systems make provision for this, the information is recorded incompletely and inconsistently. The report recommends a number of "creative" solutions to this problem. Elsewhere we have critically assessed the utility and validity of the MACRH solutions for deriving indicators for the purposes of developing non-fatal injury indicators in NZ (REF our WHO critique). In summary, none of the five solutions provide a practical basis for deriving valid alcohol-related indicators in NZ. Solution 4 (estimate alcohol attributable fractions (AAFs) and adjust indicators accordingly) offers the greatest promise, provided: (a) valid AAFs can be derived and they are updated regularly, and (b) appropriate adjustment is made for extraneous influences on the estimates of alcohol-related harm. To date the latter has not been done.

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