

**Alcohol Related Data Collection for Harm  
Reduction Purposes at the Local Level:  
A Review of New Zealand Data  
and Action Recommendations**

by

Harold D. Holder, Ph.D.

ALAC Visiting Research Fellow

Alcohol and Public Health Research Unit

With assistance from Gayl Humphrey, Kim Conway and Adrian Field

Research for this project was funded by The Alcohol Advisory Council of  
New Zealand under grant reference number: 9125 3330025

January 2003

## Table of Contents

Overview .....	2
Relevance to the Alcohol Advisory Council of New Zealand’s Strategic Plan .....	3
Community: definitions and issues .....	3
Size of a community for local alcohol information systems .....	3
Community as a system itself.....	4
Community alcohol policies .....	5
Outline of a community alcohol information system .....	6
Relevant definitions .....	6
Indicators of alcohol related harm.....	7
Drink/drive traffic crashes .....	7
Alcohol related assaults .....	8
Alcohol related unintentional non-traffic injuries and fatalities .....	9
Youth possession of alcohol in public places .....	10
Alcohol related hospitalisation.....	11
Alcohol related mortality .....	11
Indicators of alcohol related risk .....	12
Per capita alcohol consumption .....	12
Percentage of youthful drinkers .....	12
Number of heavy drinking events.....	13
Percentage of drinking drivers on the roads.....	13
Place of last drink.....	14
Number and density of alcohol retail outlets .....	14
Perceived risk of DUI by police.....	14
Minimum elements for a community alcohol information system.....	15
Level One Indicators – data already available that could be shared with local communities.....	15
Level two indicators.....	16
Conclusions .....	18
References .....	20
Appendix I: Relevant New Zealand Research.....	20
Tables .....	<b>Error! Bookmark not defined.</b>

## **Overview**

This document reports on a project to define indicators of alcohol related harm that can be used at the local level. Each local community in New Zealand, whether of small size or with a large population, needs information about alcohol problems in their area in order to achieve cost-effective prevention of such problems.

For the data to be utilised, two conditions must be met:

- Data must be specific to each community in order that the information can be locally relevant
- Data must be regularly available over time

Each community needs to know its own level of current alcohol problems in a systematic and reliable fashion and also know the history of these problems over time in order to determine the overall trends for each problem and to (a) identify specific community needs and priorities and (b) evaluate existing prevention efforts to reduce alcohol-related harms.

The goal of this report is to define a local alcohol information system for the prevention of harm. It does so by identifying a basic set of alcohol related harm indicators and the ideal standard of data collection associated with such indicators. It then assesses how such indicators might be practically developed utilising existing data and identifying potential data needs that might be addressed in the future. All of this is to enable community alcohol related harm indicators to be developed in support of local decision making and planning to prevent such harms. The report concludes with recommendations about a set of local indicators that could be implemented immediately.

## **Relevance to the Alcohol Advisory Council of New Zealand's Strategic Plan**

The current strategic plan for ALAC for 2002 to 2007 has a clear emphasis on people and communities that are at greatest risk of harm from alcohol. To identify communities at greatest risk requires information, not only at one point in time, but also over time. For the strategic plan to work, it must be possible to identify those communities with the highest levels of problems (as a percentage or per capita) for their populations.

To support the goals of the strategic plan, we must collect data that lets us know both the current and historical level of problems in a local area and also what happens to these problems as specific prevention efforts are undertaken.

The strategic plan gives special attention to young people and the restrictions of sale and supply of alcohol to underage persons, as well as efforts to reduce heavy drinking by youth. Therefore, information about the sales and supply of alcohol to youth and the drinking levels of youth in any local community is important to effectively undertake this element of the strategic plan. Two specific strategies are relevant:

*“ALAC will encourage and support community action targeted at reducing the illegal and irresponsible supply of alcohol to young people,”*

*“ALAC will work with local, regional and national agencies to monitor young people's drinking patterns, resulting problems and the efficacy of interventions”.*

Other key strategies identified in the Strategic Plan include:

*“ALAC will support, monitor and advocate the development of high quality population-based indicators of alcohol consumption and alcohol-related harm”*

and the specific outcome sought for Supply and Provision of Alcohol includes:

*“licensed suppliers do not serve alcohol to those under-age or drunk: and providers of alcohol comply with the law and act responsibly.”*

It is the conclusion of this author, based upon the review of the ALAC Strategic Plan that the Community Alcohol Information System described here would be an important complement to the strategic plan and in many cases provide essential information to local areas.

## **Community: definitions and issues**

### **Size of a community for local alcohol information systems**

Within New Zealand, the geographical and population size of local communities varies considerably. While the specific geographical or legal authority that should receive the information proposed in this paper is one to be worked out through policy, it is envisioned that the Territorial Local Authority (TLA) and/or Police Districts would be natural geographical areas around which these data could be organized. In large cities like Auckland, Wellington or Christchurch where population size is great enough to provide statistically reliable information, such data would be particularly helpful.

However, the position taken in this report is that any community of at least 1,500 persons could have a minimum set of alcohol indicators, each reported at least annually. For cities and towns of 100,000 persons or above, these indicators could be reported monthly. For communities in between, quarterly or semi-annual data could be reported. In short, all communities can make use of annual historical data about alcohol problems, even though the actual number of these problems may be proportionally small.

## Community as a system itself

A community can be viewed as both a collection of people living in physical proximity and as a dynamic social and economic system. Whichever view of 'community' one subscribes to, community residents are at risk of health problems or life difficulties involving alcohol, and prevention at the community level has a number of advantages, including:

- local citizens are close to the "scene of the action"
- the community must deal with drinking drivers, and injuries and deaths from crashes involving alcohol-impaired drivers as well as domestic assaults
- the community must provide hospital services and emergency medical services, conduct autopsies, and work with alcoholism rehabilitation and recovery

Alcohol problems are personal experiences for community members and efforts to prevent or reduce future problems are also a personal matter. Community groups can be formed within communities to support public policies and prevention efforts to reduce alcohol related harms.

To consider, for a moment, the view of communities as collections of individuals who share geographical proximity; we might target cirrhosis mortality and seek to reduce the drinking levels of heavy chronic (often dependent) drinkers. This would suggest both educational strategies and various means to increase self-identification and participation in problem drinking recovery programs (Bacon, 1947). As Holder (1987) observed, this catchment area approach is particularly useful when some of the following conditions exist:

1. The targeted condition to be prevented is contained within individuals and can be treated as an individual risk, e.g., coronary heart disease, lung cancer, or alcoholism (defined in this paper as a clinically diagnosable condition of chronic alcohol dependency that is life-disruptive). Even if the condition is contagious, such as AIDS or Polio, the disease condition is still contained within individuals.
2. The behaviours or health conditions of the individual can be identified and preventative actions prescribed as an individual-level intervention.
3. The condition is chronic, that is, remains with the individual over time.
4. The condition, while potentially influenced by environmental processes, appears to be largely defined within the context of the individual, their immediate family, and close social contacts.
5. The condition is largely disruptive of the individual's life and the immediate social network but does not usually affect directly the lives of anonymous others within the geographical boundary.

The catchment area perspective has clear limitations in alcohol problem prevention. Heavy users of alcohol and illicit drugs have the greatest individual risk rates for most problems – for example, heavy drinkers are more likely to have a traffic crash when they drink and drive – but they are not collectively the largest at-risk group. Their absolute numbers are often so small that they contribute only modestly to most aggregate community alcohol problems. For example, infrequent and moderate users of alcohol, who are not currently nor likely ever to be dependent on alcohol, account for a greater number of alcohol-involved trauma such as traffic crashes, falls, or drownings than do heavy users (see Edwards, et al., 1994). Young people, in particular, account for a disproportionately large number of alcohol-related problem events, such as traffic crashes and accidental injuries.

Most heavy, addicted drinkers continue their drinking pattern throughout their lives and never incur an alcohol-involved traffic crash or an encounter with the police. On the other hand, a young 18-year-old with limited driving and drinking experience may cause a serious traffic crash with only a small amount of alcohol in the blood system. Physical and cognitive impairment begins as soon as

the body begins to metabolise ethanol. Impairment increases as more ethanol enters the blood, and the individual can become increasingly impaired over time as drinking continues. The rate of impairment is a function of such factors as alcohol experience and tolerance, body weight, amount of food consumed while drinking, and rate of alcohol intake.

This leads us to the other view of 'community' as a system. In this view alcohol problems are the result of the social, cultural, economic and geographical nature of the community. Significant alcohol involvement exists in many community level problems, such as alcohol-involved traffic crashes (including fatalities and injuries), non-traffic death and trauma (burns, drowning, falls, assaults), while a major percentage of homicide victims have high blood alcohol levels. Each of these can be viewed as products of the community system. (See Holder, 1998.)

Many alcohol problems are stochastic events, i.e., time dependent and probabilistic. These events are not predictable in terms of individual characteristics only. The probability that any one drinker at any specific time will incur an alcohol-involved trauma or death is usually quite low. For example, the chances of an alcohol-impaired driver being stopped and arrested by the police is estimated to be 1 in 2,000 events on the average and the chances of a traffic crash following drinking are estimated to be much higher (see Farris et al., 1977; Fell, 1983a,b; Zobeck, 1986). Thus, one can argue that many alcohol problems are not simply the actions of a set of definable high-risk individuals, but rather, the cumulative result of the structure and flow of complex social, cultural, and economic factors within the community system.

It is simply not possible to permanently "inoculate" a community population against alcohol-related problems. The community is a dynamic system. The system changes as new members enter and others leave; as alcohol beverage marketing and promotion evolve, and as social and economic conditions, including employment and disposable income, change. For example, adolescent use of alcohol and other drugs within a local middle school might be targeted with strategies aimed at increasing pre-adolescents' resistance skills against peer pressure to drink, along with developing after-school activities and school-based and family-focused education programs. Not affected in this model would be community members not directly involved with the targeted at-risk populations. Retail sales of alcohol and social sources of alcohol and drugs to young people might also be ignored.

### **Community alcohol policies**

Because communities are dynamic systems, no single prevention program - no matter how good - can sustain its impact, particularly if system-level changes are not accomplished (see Holder & Wallack, 1986; Wallack, 1981). (Applications of the community system perspective in New Zealand include Casswell and Gilmore, 1989; and Casswell, et al, 1989.)

In order to make changes in the community system, public policies are needed.

A policy is any established process, priority, or structure that is purposefully sustained over time. Thus, alcohol policy, at whatever level it is implemented, is an environmental or structural response to alcohol problems. That is, policy is used to produce structural changes in the drinking environment. In turn, changes in the environment effect changes in drinking behaviour. National governments often establish the base for local policies, including legal drinking ages, regulation of alcohol outlets, the legal blood alcohol level for drinking and driving, advertising restrictions, and service to obviously intoxicated persons and underage persons. Local policies often address the implementation and enforcement of these laws.

At the local level, policy makers can establish the priorities for community action to reduce risky behaviour involving drinking, which, in turn, can reduce the number of alcohol-involved problems. Thus, possible local alcohol policies can include making a priority of drinking and driving enforcement by the local police; mandating server training for bars, pubs, and restaurants; setting a written policy for responsible alcohol beverage service by a retail licensed establishment; or allocating enforcement resources to prevent alcohol sales to underage persons.

One important example of local alcohol policy is enforcement of laws concerning drinking and driving. Many competing demands are made on local police for enforcement priorities. The priority police give to DUI (Driving Under the Influence) deterrence can be expressed to the community by the level of attention and resources the police commit to drinking and driving deterrence. This type of administrative (not regulatory) decision is an example of a local policy that can be very effective. Another example of local policy is reflected in the alcohol serving practices of bars and restaurants and the sales of alcohol to underage persons by off-premise establishments. Alcohol serving practices reflect policy, whether or not that policy is written. By applying a broader definition of alcohol policy, one that goes well beyond the direct regulation of retail sales of alcohol by government, the prevention repertoire of the community is greatly increased.

### **Outline of a community alcohol information system**

At the local level, valid and reliable information should be available to empower the community to:

- Monitor the extent of and changes in alcohol related problems in their locality
- Identify those problems that need attention for prevention
- Evaluate any local prevention efforts to reduce problems
- Utilise the information to plan evidence-based interventions

The system is **locally relevant** in that it provides data specific to the geographical area that defines each community, is **management information** in that it is to support local decision making, and is **prevention** in that it is used to reduce future alcohol related harm.

### **Relevant definitions**

**Alcohol Related Harm:** A specific and defined social or health problem to which alcohol or drinking increases the risk of this problem. For example, traffic crashes are a natural part of a modern system of driving but a driver who drinks has substantially increased risk of a crash, i.e. a drink/drive crash.

**Alcohol Related Risks:** Alcohol related risks are those factors or variables which, while not specific harms (as defined above), are themselves often precursors of such harms. That is, these risks in themselves substantially increase the likelihood of alcohol related harm. For example, drinking to intoxication or heavy (“binge”) drinking may not be a problem for any one drinker, but the frequency of such heavy drinking substantially increases the risks of acute trauma including falls, drowning, traffic crashes, violence, etc.

**Indicator:** The specific measurement of each harm or risk as defined.

**Management Information System:** A system of data retrieval, organisation, and dissemination such that indicators of each alcohol related harm and critical risks are made available to local decision makers on a routine basis. For such information to be of greatest value for management decisions at the local level, it should be valid (an accurate measure of the defined harm), reliable (be collected in a similar and consistent manner over time) and available (provided in a timely manner and plotted against all available history for each indicator).

No claim should be implied from this report that the ideas developed here are unique or have not been discussed in prior reports or research efforts within New Zealand. This report has made extensive use of a large variety of reports, listed in Appendix I.

## **Indicators of alcohol related harm**

The design of this proposed system is based first upon defining the types of alcohol related harm data that should routinely be provided to local decision makers and secondly on determining the practical feasibility of providing such data at the local level (**See Table 1**). The specific alcohol related harms recommended for local monitoring are discussed below, while recommendations for implementing the indicators are made in the final section of the report.

### **Drink/drive traffic crashes**

Drink/drive crashes are defined as those in which at least one driver involved in the crash had been drinking. They fall into three categories: non-injury crashes, injury crashes and fatal crashes (in which at least one person is killed). As the likelihood of being involved in a traffic crash is greater when a driver has been drinking and the cost (economic and social) of such crashes is high, this is an important indicator of alcohol related harm.

In ideal circumstance, Blood Alcohol Content (BAC) readings (recorded as a Breath BAC measurement) would be collected for all drivers involved in traffic crashes from traffic crash reports made by the New Zealand Police.

### **Alternative indicators or surrogates**

As the police do not currently collect a breath sample for all drivers in all crashes, the ideal indicator noted above cannot currently be met without a change in police practices. However, acceptable alternatives would be:

- Data from all fatal crashes
- Data from all crashes where alcohol involvement was presumed to have been a cause
- Data from all identified drink/drive injury crashes

## **Usefulness, limitations and concerns about these data**

### *Fatal injury crashes*

In the case of utilising BAC data from fatally injured drivers, this is currently collected by the Land Transport Safety Authority from blood tests conducted by hospitals or local coroners. A major limitation is its dependence upon timely testing and testing of all deceased drivers.

As there is considerable variation in BAC testing of dead drivers across New Zealand and evidence of inconsistent testing across local areas in NZ, this would currently be regarded as an unreliable indicator, but one that could be achieved to support public policy at national and local levels.

### *Police reporting of suspected alcohol involvement*

With regard to data from crashes where alcohol involvement was presumed to have been a cause, this can be obtained from the Accident/Incident Forms completed by the New Zealand Police after traffic crashes to which they are called. The attending officer can record his or her suspicions of alcohol involvement under the section of the form that asks whether “alcohol perceived to be present”.

While such data are routinely collected, it must be noted that they do not always indicate the extent to which alcohol is involved (i.e. BAC data not always collected). An example when BAC is not collected is if a driver hits a pedestrian and the driver has not been drinking but the pedestrian has. As such, the alcohol data represents judgment on the part of the local police officer who completes the traffic crash report.

It is this judgment that causes concern about the reliability of these data. However, if used in conjunction with the Land Transport Safety Administration’s annual roadside survey of driving information, they would prove a valuable indicator. This survey collects data that are nationally representative and include the BAC levels of drivers. They are not locally representative but could

be used to test the validity (evidence of systematic error) of officer judgment about alcohol involvement. Since the data are currently collected by New Zealand police, they could be organised and reported over time to local communities

#### *Drink/drive injury crashes*

Data from reports of drink/drive crashes where medical attention is required or sought are available from the Accident Compensation Corporation of New Zealand.

This indicator would be useful since there is a suggestion that many road traffic crashes - especially if only a single vehicle is involved (and often where the driver is alcohol-impaired) - may not be reported to the police. However the injured person may present themselves for medical treatment or be taken by ambulance to a hospital Accident & Emergency department. For this data to be utilised at the local level there must be consistent reporting of traffic crashes AND the involvement of alcohol. This can be achieved firstly, by standardising alcohol recording within Accident & Emergency departments and secondly, through the documentation of alcohol involvement according to the judgement of ambulance staff. Data from this second aspect is currently available from some ambulance regions in New Zealand and could be made widely available.

It should also be noted that there are legal processes medical practitioners are required to follow if alcohol involvement is to be legally proven. The legal requirements are documented under the Transport Act 1961, in particular Section 57A to 58F. This process is generally instigated at the request of a police officer. Medical practitioners may instigate this independently, and a police officer informed at this time.

#### **Alcohol related assaults**

As with vehicle crashes, alcohol consumption increases the risk of being involved in an assault, as victim or perpetrator. Assault in this context is defined as an intentional violent event in which one or more person is harmed sufficiently seriously to require some type of medical attention, and in which at least one person involved in the event had been drinking. Such assaults can be divided into public assaults (those which occur in public places such as bars or pubs or in the public streets) and domestic assaults, which occur within the home.

In ideal circumstances, the data most useful to communities would be a direct measurement (BAC reading) of every public and domestic assault victim and assailant. BAC readings would need to be taken by the police officers attending each crime scene where an assault was involved.

The current situation is that local hospital emergency departments (ED), trauma centres, and private accident emergency providers collect patient BAC readings on a very selective basis, making local monitoring data unreliable at present.

#### **Alternative indicators or surrogates**

As it is not currently feasible to collect data from every assault, several alternatives are suggested:

- BAC readings of victims of serious assault
- Police officer assessment of alcohol involvement by violent offenders
- Police officer assessment of alcohol involvement in domestic violence situation by victim and offender
- BAC level of cases first contacted by ambulance/first response personnel.

#### **Usefulness, limitations and concerns about these data**

##### *BAC readings of victims of serious assault*

If “serious” cases (such as those requiring overnight hospitalisation or specific types of emergency care) were consistently tested nationwide, the data produced would be of great value to local communities.

### *Police assessment of offenders' drinking*

As with alcohol involvement in vehicle crashes, the Accident/Incident Form completed by police provides for attending officers to make an assessment of "alcohol perceived as present" and estimate the "level of intoxication". Although these data are limited by the accuracy and consistency of officers' judgments, they can be used to provide useful information for communities.

### *Police assessment of drinking in domestic violence cases*

The New Zealand Police collect data on domestic violence in the form of the Police Family Violence Report. This form is potentially valuable because it is event based and not the basis of criminal charges. It provides space for attending officers to make an assessment of whether alcohol is involved in the incident. These data, while limited because of their dependence on the accuracy and consistency of officers' judgment, would still be of great value.

### *BAC reading taken by ambulance/first response personnel*

As emergency vehicle personnel are often among the first to attend an assault, it would be possible to have them complete a BAC test or make an assessment of the alcohol involvement in an assault. This however, raises a number of issues. At an operational level, in the case of personnel making an assessment of alcohol involvement, accuracy and personal judgement issues arise. And perhaps more importantly, the suggestion that emergency personnel carry out this test/assessment raises wider-scale issues of cost and policy.

## **Alcohol related unintentional non-traffic injuries and fatalities**

It is known that alcohol is a contributing factor in a significant proportion of unintentional non-traffic injuries; fatal and non-fatal. In this context injuries are alcohol-related if the person had consumed alcohol prior to the event.

Injuries can usefully be divided according to type or location of injuries. Typical injuries include burns, falls (related to the alcohol impairment of the individual), drowning (in which the person who drowned had consumed alcohol or as the result of a boating accident in which at least one of the boat operators had been drinking). Non-fatal injuries are discussed separately from fatal injuries.

Ideally BAC tests would to be carried out on all fatalities and on all injury and trauma cases presenting to hospitals emergency departments, trauma centres, and private accident emergency providers. In the case of non-fatal injuries, all results would be recorded on Accident Compensation Corporation reports of each incident. In the case of fatalities, the data would be available from local coroners.

If routinely collected, these data would provide an ideal indicator for local communities.

## **Alternative indicators or surrogates: non-fatal injuries**

The current situation is that emergency care providers collect BAC on injury patients on a very selective basis; generally the most serious cases. Thus alternative indicators are:

- Alcohol-involved poisoning cases
- Developing a specific New Zealand indicator, based on factors in an injury or assault that are highly associated with drinking

## **Usefulness, limitations and concerns about non fatal unintentional injury data**

### *Alcohol-involved poisoning cases*

Any differential diagnosis of poisoning requires a notification be sent to the Medical Officer of Health, which means this data is available from the Ministry of Health. However, it should be noted that if other conditions are also present, the presence of alcohol as source of poisoning may

be obscured and the notification form not filed. Despite the data being limited by medical provider practice, it could be used at the local level as an indicator of high volume drinking.

#### *New indicator*

An indicator could also be developed based on hospital admissions data, using such potential factors as gender, age, type and severity of injury, etc. as a predictor of BAC level. This would be feasible if using reliable data on a large number of hospital admissions in which there was clearly identified data on alcohol involvement.

#### **Alternative indicators or surrogates: fatalities**

As the measurement of alcohol involvement in unintentional non traffic fatalities is currently not consistent throughout the country, with no requirement to test all victims, it is suggested that data on deaths caused by drowning in which alcohol is involved would provide a useful surrogate.

#### **Usefulness, limitations and concerns about fatal unintentional injury data**

BAC readings of drowning victims are collected normally but selectively by local coroners. This lack of structured selectivity with regard to victim testing is a limitation of the data, but even so, it could be provided to local communities. The data would be greatly enhanced if there were specific guidelines on the selection criteria for cases to test.

#### **Youth possession of alcohol in public places**

With research suggesting that young people are particularly at risk of harm from alcohol consumption, an ideal indicator for local purposes would be the number of youth under the current legal age who have actually purchased alcohol. Since this event is an illegal act, it is defined as an alcohol related harm.

Ideally this would involve measuring the percentage of all underage youth actually able to purchase alcohol in licensed establishments.

#### **Alternative indicators or surrogates**

While it is not currently possible to achieve the ideal of sampling the entire population, alternative indicators could be:

- Percentage of youth able to purchase alcohol based upon the New Zealand National Alcohol Survey and the ALAC Youth Monitoring Survey
- Police citations given to underage youth attempting alcohol purchases
- Warnings issued as well as prosecutions of licensed establishments charged with selling alcohol to underage youth
- Percentage of underage purchases made through controlled purchase operations organised by regulatory and enforcement bodies
- Percentage of youth able to purchase alcohol without age verification based on local pseudo patron surveys

#### **Usefulness, limitations and concerns about these data**

##### *Purchases from survey data*

The surveys mentioned above collect data on underage purchase of alcohol. However, these surveys do not currently have samples large enough to allow analysis of data from cities and local areas with populations under 100,000.

### *Police citations*

While these data are available on a local (police district) basis from Police Infringement Notices, they reflect the level of local police enforcement and are not necessarily indicative of the level of attempts by underage youth to obtain alcohol in any particular area.

### *Police/District Licensing Authority warnings to licensed premises*

Based on District Licensing Authorities' (DLAs) reports or the New Zealand Police Licensed Premises Visit Sheet, it would be possible to measure the percentage of licensed establishments in an area given notice by police and or DLAs for selling alcohol to youth. Although these reports primarily reflect the level of surveillance and attention to enforcement, they are potentially quite useful and could be developed for local areas.

### *Controlled Purchase operations and pseudo patron surveys*

A number of local level pseudo patrons surveys have been carried out. These provide useful monitoring information at the local level but require additional resourcing or deployment of resources to mount.

## **Alcohol related hospitalisation**

In addition to the acute medical consequences of heavy drinking and alcohol related trauma events, hospitalisation often occurs as a result of long term and chronic drinking. This indicator relates to the treatment of medical conditions caused by or strongly related to long-term alcohol consumption; including dependent drinking or alcoholism (e.g. liver cirrhosis or gastritis).

The ideal indicator is one in which all alcohol related (e.g. ICD-10) hospital stays are recorded as a total number of hospital days. Although these data would be available from hospital admission records and could be developed for all local areas in New Zealand, there is a selectivity by medical personnel to assign alcohol linked ICD codes on hospital admission records. However, since all hospital record systems are computerised, a requirement could be applied that no patient can be discharged without completing an ICD code for every case.

## **Alcohol related mortality**

This is defined as death caused in part or in full by heavy, usually long-term, consumption of alcohol. These conditions are typically defined on death certificates by ICD-9 codes such as 305.0 (Alcohol Abuse), 303 (Alcohol Intoxication), 291 (Alcohol psychoses), 425.5 (Alcoholic Cardiomyopathy), 535 (Alcohol Gastritis), 571 (Liver Cirrhosis), and E860 (Fetal Alcohol Syndrome), and E860.0 (Alcohol Poisoning for alcohol intended for consumption) and E860.1-.4, .8 & .9 (for unspecified ethyl alcohol and its products). The latest ICD format is currently being introduced (ICD 10) and as such the conditions will have new codes attached.

The ideal indicator involves the consistent assessment of alcohol involvement in, or as a contributor to, every death in New Zealand. This data would be obtained from the New Zealand Health Information Service, based on ICD codes for mortality related to chronic drinking and BAC blood testing to establish mortality related to acute drinking. In principle these data are available for every locality within New Zealand. However, at present ICD codes are selectively, recorded on death certificates.

## **Indicators of alcohol related risk**

While there are a number of potential risks that can contribute to any one or more of the harms discussed above, the following alcohol related risks are defined to be the most useful and relevant indicators for decisions about prevention of local alcohol related harms (see **Table 2**). A discussion of how these indicators may be implemented is found in the final section of the report.

### **Per capita alcohol consumption**

This is the average consumption of absolute alcohol per person aged 15 and above. It has been shown that average per capita alcohol consumption is closely associated with the actual level of a number of alcohol related harms, making this an important risk factor.

The ideal indicator in this case - representing perfect recording of all alcohol consumed - requires everyone aged 15 years and older to complete an annual survey comprising a personal record of their alcohol consumption over the previous 12 months. This is, of course, currently infeasible.

### **Alternative indicators or surrogates**

In the absence of ideal data, some alternative indicators are:

- Volume of alcohol sold in licensed alcohol outlets in each local area.
- Inclusion of self-reported consumption on frequently conducted surveys

### **Usefulness, limitations and concerns about these data**

#### *Volume of alcohol sold in licensed alcohol outlets in each local area*

This would consist of licensed establishment sales records, obtained from Liquor Licensing Authorities or District Licensing Authorities. At present, such sales records are not collected and the indicator is therefore currently not feasible to implement.

#### *Self-reported consumption on surveys*

Self-reporting of alcohol consumption would provide a useful indicator if derived from surveys with sufficient coverage of the local population to provide valid local area estimates. Although New Zealand National Alcohol Surveys of self-reported alcohol consumption have been carried out and Statistics New Zealand's Household Economic Survey records the percent of household income spent on alcohol, neither has had sufficient local coverage to enable annual estimates of alcohol consumption for all local areas.

### **Percentage of youthful drinkers**

This is the percentage of the population under the legal drinking age who have consumed at least one alcoholic drink over a specific time frame; for example the last 30 days. This is a useful indicator of potential alcohol involved harm for the young, especially since, in many cases, they are inexperienced alcohol consumers and alcohol can have greater impairment effects for decision-making and/or motor skills such as those required to drive, operate other machinery, operate a boat, swim safely, etc.

As with per capita alcohol consumption, the ideal indicator would comprise data from a personal record of alcohol consumed annually by youth, categorised by age group. As this ideal is infeasible, the following alternative is suggested.

### **Alternative indicators or surrogates**

Again, as in the case of per capita consumption, self-reporting of alcohol consumption would provide a useful indicator if derived from surveys with sufficient coverage of the local population to provide valid local area estimates. Although New Zealand National Alcohol surveys of self-reported alcohol consumption have been carried out and Statistics New Zealand's Household Economic Survey records the percent of household income spent on alcohol, neither has sufficient local coverage to enable annual estimates of alcohol consumption for all local areas. Specific

demographic and drinking patterns' data could potentially be collected from regional alcohol and drug services' youth data to contribute to the understanding of local drinking trends and problems.

### **Number of heavy drinking events**

High volume alcohol consumption (5 or more drinks per occasion for males and 4 or more drinks per occasion for females) is highly associated with increased risks of acute alcohol related harm including drink/drive crashes, injuries, assaults, etc. Factors such as age and gender further increase these risks.

The ideal indicator of heavy drinking would be derived from the personal record discussed in the sections above.

### **Alternative indicators or surrogates**

As above, self-reports of heavy drinking events derived from the New Zealand National Survey data would prove useful if such surveys sampled sufficient cases to allow valid estimates for every locality. Demographic data collected from regional alcohol and drug services related to numbers of heavy drinking events could also contribute to an understanding of types of problems emerging.

### **Percentage of drinking drivers on the roads**

The number of alcohol positive drivers on the road is highly related to the number of drink/drive crashes; with risk increasing as the distribution of BAC positive drivers changes to include more high BAC drivers (e.g. BAC > .05).

The ideal indicator of numbers of alcohol-impaired drivers on the road is to collect BAC measurements for all drivers on the roads and tabulate the distribution of BAC levels.

### **Alternative indicators or surrogates**

Since it is highly infeasible to collect BAC data from all drivers, several alternatives are suggested.

- Distribution of BAC among drivers subject to Police Compulsory Breath Testing (CBT)
- Distribution of BAC among drivers surveyed by the LTSA roadside surveys
- BAC of drivers arrested on drink/drive offences

### **Usefulness, limitations and concerns about these data**

#### *Police CBT results*

Under the New Zealand Police powers of compulsory breath testing, a large amount of locally relevant data is potentially available. If these data were made available on a local level – at least quarterly – this could provide a most valuable indicator of level of drink driving over time in each locality.

A limitation of these data is that CBT is not carried out to obtain a scientifically valid sample of drivers in a community road system. These data (time, day and level of BAC) for every driver tested is stored on a chip in the breath testing equipment used in CBT. In order to be locally useful these data would need to be downloaded into a database to develop distributions for BAC by locality. Currently the results of each individual test are erased each time the machine is calibrated.

#### *Distribution of BAC among drivers surveyed by the LTSA roadside surveys*

The Land Transport Safety Authority conducts an annual roadside survey with a scientifically valid sample of drivers. This will provide data on the percentage of drivers on the road by BAC levels. However, data is not representative of local areas and thus not immediately useful.

#### *BAC of drivers arrested on drink/drive offences*

Arrest Reports for drivers who have a BAC level equal to or higher than the legal limit are held by the New Zealand Police. This is a poor indicator of actual drink/drive events, since the number of

arrests is directly related to the level of enforcement by local police. However, the data are readily available and could be useful as a local indicator if used in conjunction with officer reports of alcohol involvement and other indicators.

### **Place of last drink**

The location of drinking for a drink/driver or assailant in an assault event is an indicator of drinking venues that increase the risk of alcohol related harm. Ideally, communities need to know the retail establishment or social location at which most alcohol was consumed by a person involved in (a) a drink/drive crash, (b) a non traffic injury or fatality, or (c) an alcohol related assault. However, this is not feasible as such data (from police and hospital emergency department admissions) only cover those who come to the attention of the police or who attend an accident and emergency department.

### **Alternative indicators or surrogates**

Accepting this limitation, police data – in the form of the Accident/Incident report – could provide an alternative indicator as within the “alcohol indicated” section there is provision for the “place of last drink” to be recorded.

### **Usefulness, limitations and concerns about these data**

The “place of last drink” as recorded by police gives some indication of the retail establishments in a local area where drinking is occurring prior to an arrest. The recording is always subject to the reporting biases of individuals questioned by police and perception of police that alcohol has been involved.

### **Number and density of alcohol retail outlets**

Both the absolute number and the concentration (number of outlets per 100 persons and/or geographical area) of alcohol retail outlets is an indicator of potential risk at the local level. Both on-premises (such as bars and restaurants) and off-premise (alcohol to be taken away for consumption elsewhere) outlets need to be included.

In principle this mapping and density determination can be developed for every local area based upon the addresses of every licensed outlet in New Zealand – data held by the Liquor Licensing Authority/District Licensing Authorities. The Alcohol and Public Health Research Unit has demonstrated the feasibility of GIS coding of licensed outlets and alcohol problems in the Auckland area. This would be possible for other local areas as well.

### **Perceived risk of DUI by police**

This is the perception held by the drivers about the likelihood that a driver who has been drinking will be stopped and apprehended by the police.

The ideal indicator would be the level of perceived risk of every driver in New Zealand by local area. As this is not currently feasible, two alternative indicators are discussed below.

### **Alternative indicators or surrogates**

- Level of perceived risk estimated from LTSA Roadside Survey
- Level of perceived risk of drivers who are tested during CBT

### **Usefulness, limitations and concerns about these data**

#### *Level of perceived risk estimated from LTSA Roadside Survey*

From the Land Transport Safety Authority annual national survey it is possible to derive an estimated indication of the level of perceived risk. This survey does not currently provide locally valid data, but with sufficient sampling to enable valid estimates for all local areas, this measure could be routinely monitored.

### *Level of perceived risk of drivers who are tested during CBT*

This would involve measuring the perceived risk level of drivers who are tested during CBT. To the extent that CBT is somewhat representative of the drivers in each local area, the results of a simple question (as a rating) about likelihood of drink drive detection from each tested driver could be used. Such a question could be asked of every tested driver but this would require (a) the willingness of the police to actually ask the question and record the results and (b) a means to record the answer for each tested driver.

### **Minimum elements for a community alcohol information system**

The following are recommendations on developing a Community Alcohol Information System for New Zealand. The first set of indicators discussed is those that are either currently available or could readily be made available and could be provided with minimum cost and difficulty. These are referred to as *level one indicators*. The second set, *level two indicators* could be made available with modest investment and changes in practices or standards for testing and/or reporting.

### **Level One Indicators – data already available that could be shared with local communities**

#### **Presumed drink/drive traffic crashes**

Based on officer assessment of suspected alcohol involvement by police attending drink/drive crashes, the data recorded on the Accident/Incident Form offers a useful local indicator, especially since the data are currently collected by New Zealand police and could be organized and reported over time to local communities.

As noted previously, a major issue with these data is that they are based on the individual judgement of the officer completing the traffic crash report. In order to overcome this, the data collected would need to be shown to be highly associated over time with actual drink/drive crashes. This could be achieved by validating the data against Land Transport Safety Authority annual roadside survey data which are nationally representative and include the BAC levels of drivers.

#### **Police officer assessment of drinking in domestic violence situation by victim and offender**

Data from the Police Family Violence Report Form can be organised and reported to local communities. While limited because of the dependency on officer judgment, the data does have the advantage of being incident-based and not dependent upon actual arrests or charges.

#### **Police officer assessment of drinking by violent offenders**

Once again, the New Zealand Police Accident/Incident Form, completed by attending officers, provides for officer assessment of whether “alcohol is perceived as present” and their estimation of “level of intoxication.” Similarly, the Loose Leaf Charge Form provides a space for the police to indicate if a person in custody is “under the influence of alcohol”. These data, while limited via its dependency upon officer judgment, are readily available and can be organised in a way that is useful to local communities.

#### **Death by drowning in which alcohol is involved**

While at present, BAC data of drowning victims are only selectively collected by local coroners, such data are available and are locally useful. With the development of specific guidelines on the selection criteria for which drowning cases to consistently test, the usefulness of this indicator would be greatly enhanced.

#### **Alcohol-involved poisoning**

Since poisoning is a notifiable event, these data are readily available. It has been noted however, that the presence of other conditions may obscure the presence of alcohol (as source of poisoning), which means the form is not filed. However, in some hospitals a combined alcohol and/or other

drug form is used that enables alcohol to be linked to other poisonings where relevant. It is recommended this approach be adopted.

### **Licensed establishments warned about selling alcohol to underage youth**

Both the New Zealand Police and District Licensing Authorities record/report the percentage of licensed establishments in an area given notice for selling alcohol to youth. While these reports may say more about local levels of surveillance and attention to enforcement, the data could be developed for local areas and used effectively.

### **Police citations given to underage youth attempting alcohol purchases**

While counts of citations are a reflection of the level of local police enforcement, and not necessarily indicative of level of attempts by underage youth in all local areas, such data are available from Police Infringement Notice counts and can be summarized for local areas.

### **Percentage of drinking drivers on the roads**

Available from the Police and local Land Transport Safety Authorities these data could provide valuable indicators of level of drink driving over time in each locality, if made available at least annually in small areas and quarterly in larger areas.

It would be necessary for CBT data (time and day and level of BAC) to be downloaded from the breath testing equipment into a database to develop distributions for BAC by locality. Currently these results are erased each time the machine is calibrated.

### **Location and identification of licensed establishments contributing to heavy drinking in a local area**

Retail establishments that are contributing to (a) drink/drive crashes, (b) a non-traffic injury or fatality, or (c) an alcohol related assault can be identified in many local areas via the “last drink survey” (LDS) on Police offences records. Questions include: “Where did you have your last drink?”, “How long ago”, “Where did you buy your last drink?” and “Have you consumed alcohol at any other place in the last 4 hours?”.

While this survey is always subject to the reporting biases of individuals questioned by police, if these data are collected consistently across all police reports, this surrogate can be used to indicate which retail establishments are contributing to drink/drive problems in each local area. Alcohol Healthwatch is currently working with New Zealand Police on consistent data-gathering practices. This indicator could be implemented immediately.

### **Number and density of alcohol retail outlets**

Counts and geospatial location mapping of every licensed outlet could be carried out for every local area based on the addresses of these outlets, which could then be cross mapped with crime and incident GIS data that is currently available through the New Zealand Police. (Wellington is already using GIS mapping according to Laurie Gabites, Wellington City Council).

### **Level two indicators**

#### **Blood alcohol concentration for fatal drivers**

Blood test results of all dead drivers could be reported through the Land Transport Safety Authority. While there is considerable variation in BAC testing of dead drivers across New Zealand and evidence of inconsistent testing across local areas in NZ, making the indicator currently unreliable, it is one that could be achieved to support public policy at national and local levels and via the introduction of national standards for testing all fatally injured drivers throughout New Zealand.

### **Alcohol related unintentional non traffic injuries**

If BAC levels of all non-traffic and non assault injury and trauma cases are routinely collected by hospital emergency departments, trauma centres and private accident emergency providers, these data could be provided to local communities. Until this comprehensive collection and reporting is achieved, it would be possible to begin a local reporting system based on current reporting to demonstrate feasibility and then to work toward standard testing and reporting.

It would also be possible for an addition to the Accident Compensation Corporation (ACC) form from emergency medical providers when alcohol or drinking is present.

### **Alcohol related unintentional non traffic fatalities**

If consistent and systematic BAC testing of all unintentional non-traffic fatalities could be obtained by local coroners, these data would be valuable to local communities. If it proves infeasible to test all cases, selective testing is recommended, based on a set of specific guidelines for selecting which cases should be sampled.

### **Alcohol-related hospitalisation**

As alcohol related ICD codes are often included in hospital admission records, this indicator could be developed for all local areas in New Zealand, although it should be noted that there is a selectivity by medical personnel to complete the forms that then are assigned codes by medical coders. However, since all hospital record systems are computerised, a requirement could be applied that no patient cannot be discharged without completing an alcohol involvement code for every case. The ICD version 10 has two new codes that could enable this to be achieved (Y90 and Y91).

### **Alcohol related mortality**

A clear understanding of alcohol involvement in, or as a contributor to, every death in New Zealand would require consistent application of ICD codes on death certificates.

In the case of chronic fatalities, pathology reports would need to be routinely conducted and alcohol involvement consistently reported by physicians in death certificates if alcohol was a contributory factor to either the chronic condition or death.

In the case of acute fatalities, post mortem pathology BAC levels are not currently obtained for every fatality. Thus, it would be necessary to develop and apply consistent and national standards to identify all cases that should be tested. For example, testing of all acute non-traffic deaths (falls, burns, drownings, suicides, homicides etc.) for alcohol involvement.

### **Minor/underage possession of alcohol in public places**

The total number of underage purchases divided by the total number of purchase attempts could be derived from pseudo patron surveys using a national standard approach to ensure comparability. These sources could be used if they routinely collected data on a representative basis for all localities.

These could also give counts of purchases over time by young people as a part of local “purchase” surveys.

### **Self-reported drinking**

In order to implement this indicator, surveys (such as the New Zealand National Alcohol Survey and Statistics New Zealand’s Household Economic Survey) would need sufficient coverage of the local population to provide valid local area estimates.

### **Percentage of underage drinkers and heavy youthful drinkers**

As with general self-reported consumption, youth surveys would require sufficient coverage of the local population to provide valid local area estimates.

### **Number of hazardous drinking events**

For this indicator to be implemented personal records of heavy drinking events or self reports of heavy drinking events would need to be obtained from the New Zealand National Alcohol Survey with sufficient cases to allow valid estimates for every locality are essential. Future National Surveys could be expanded to provide local representation. Similarly, the Statistics New Zealand Household Economic Survey, which currently only records the percent of household income spent on alcohol, could also be expanded to provide sufficient local sampling to enable annual estimates of alcohol consumption.

### **Level of perceived risk of arrest for drink drive**

The preferred data source for this indicator is the LTSA national survey. In order for the indicator to be implemented, the sample used in this survey would need to be expanded to provide sufficient cases for valid estimates for all local areas.

If it is not feasible to modify the LTSA survey as suggested above, an alternative source of data would be the self-report of perceived risk of arrest obtained from drivers tested during CBT. An advantage of this is that CBT is somewhat representative of the drivers in each local area. However, to collect such data requires (a) the willingness of the police to actually ask the question and record the results and (b) a means to record the answer for each test driver.

### **Conclusions**

This report has identified two levels of indicators that could be used in community alcohol information systems, with the first collected with minimum cost and establishment, and the second requiring more investment and structure.

Even with the level one indicators, however, resourcing would be required in order to facilitate the coordination of collection and collation of data and to ensure that the information is fed back to local communities in a useable and appropriate form to inform local strategies.

The size of the resource required depends on the extent to which it is envisaged such data collection and reporting back would reach into local communities and the frequency of such reporting. This, in turn, depends on the level of resources for local alcohol health promotion and other alcohol harm prevention work that is available in communities within New Zealand.

Obviously this is a question that needs to be answered within the context of ALAC's overall strategic planning for health promotion at the community level in New Zealand. The conclusions that can be drawn from this report are:

1. That resources should be made available for a data management service to
  - coordinate the collection and collation of level one indicator information. This could involve working with existing or potential stakeholder organisations (such as St Johns Ambulance services) to improve or establish standard form development codes, language, processes eg intoxication scales.
  - monitor the consistency of production of level one indicator and assess reliability and validity of information.
2. That resources should be made available to disseminate available indicator information to local communities.
3. That resources should be made available to undertake further work towards developing level two indicators where appropriate.

As stated above, the exact nature and location of this resourcing (e.g. a mix of people specifically contracted, roles allocated to those currently employed in the alcohol health promotion area, and

dissemination of infrastructure such as web sites) needs to be determined in the context of ALAC's overall strategic planning for community based health promotion.

## References

- Bacon, S. (1947). The mobilization of community resources for the attack on alcoholism. Quarterly Journal of Studies on Alcohol, 8:473-497.
- Bruun, K., Edwards, G., Lumio, M., et al. (1975). Alcohol Control Policies in Public Health Perspective (No. 25). Helsinki: The Finnish Foundation for Alcohol Studies. Forssa.
- Casswell, S. (1995). Public discourse on alcohol implications for public policy. In Holder, H.D. and Edwards, G. (eds.) Alcohol and Public Policy: Evidence and Issues, pp. 190-211. New York: Oxford University Press.
- Casswell, S. and Gilmore, L. (1989). An evaluated community action project on alcohol. Journal of Studies on Alcohol, 50:339-346.
- Casswell, S., Gilmore, L., Maguire, V., et al. (1989) Changes in public support for alcohol policies following a community-based campaign. British Journal of Addiction, 84:515-522.
- Edwards, G., Anderson, P., Babor, T.F., et al. (1994). Alcohol Policy and the Public Good. New York: Oxford University Press.
- Grube, J.W. (1997). Preventing sales of alcohol to minors: Results from a community trial. Addiction, 92 (Supplement 2):S251-S260.
- Harrison, J.R. and Laughlin, D. (1993). Raising the priority of alcohol over other drug problems in a community--behavioural epidemiology versus community opinion. Health Promotion Journal Aust, 3:49-54.
- Hawks, D., Stockwell, T., and Casswell, S. (1993). Helping research and policy meet. Addiction, 88(Supplement):5S-7S.
- Hingson, R., McGovern, T., Howland, J., et al. (1996). Reducing alcohol-impaired driving in Massachusetts: The Saving Lives Program. American Journal of Public Health, 86(6):791-797.
- Holder, H.D. (1992). Chapter 2: What is a community and what are implications for prevention trials for reducing alcohol problems, and Chapter 14: Undertaking a community prevention trial to reduce alcohol problems: Translating theoretical models into action. In Holder, H.D. and Howard, J.M. (eds.) Community Prevention Trials for Alcohol Problems: Methodological Issues, pp. 15-33 and 227-243. Westport, CT: Praeger Press.
- Holder, H.D. (1998). Alcohol and the Community: A Systems Approach to Prevention. Cambridge: Cambridge University Press.
- Holder, H.D. and Treno, A.J. (1997). Media advocacy in community prevention: News as a means to advance policy change. Addiction, 92(Supplement 2):S189-S199.
- Holder, H.D. and Wallack, L.M. (1986). Contemporary perspective for the prevention of alcohol problems: An empirically derived model. Journal of Public Health Policy, 7(3):324-339.
- Holder, H.D., Saltz, R.F., Grube, J.W., et al. (1997). A community prevention trial to reduce alcohol-involved accidental injury and death: overview. Addiction, 92 (Supplement 2):S155-S171.
- Holmila, M. (ed.) (1997). Community Prevention of Alcohol Problems. London: Macmillan.
- Midford, R., James, R., Oddy, W., et al. (1995). Alcohol consumption and harm in two Western Australian regional centres. Australian Journal of Public Health, 19(1):41-45.
- Reynolds, R.I., Holder, H.D., and Gruenewald, P.J. (1997). Community prevention and alcohol retail access. Addiction, 92(Supplement 2):S261-S272.
- Saltz, R.F. and Stanghetta, P. (1997). A community-wide responsible beverage service program in three communities: early findings. Addiction, 92 (Supplement 2):S237-S249.
- Treno, A.J., Breed, L., Holder, H.D., et al. (1996). Evaluation of media advocacy within a community trial to reduce alcohol involved injury: Preliminary newspaper results. Evaluation Review, 20(4):404-423.
- Voas, R.B., Holder, H.D., and Gruenewald, P.J. (1997). The effect of drinking and driving interventions on alcohol-involved traffic crashes within a comprehensive community trial. Addiction, 92(Supplement 2):S221-S236.
- Wagenaar, A., Gehan, J., Jones-Webb, R., et al. (1999). Communities mobilizing for change on alcohol: Experiences and outcomes from a randomised community trial. In Casswell, S., Holder, H., Holmila, M., et al. (eds.) Ketil Bruun Society Thematic Meeting: Fourth Symposium on Community Action Research and the Prevention of Alcohol and Other Drug Problems, pp. 266-277. University of Auckland: Alcohol & Public Health Research Unit.
- Appendix I: Relevant New Zealand Research**
- Brinson, Sandy. (1998). Alcohol Data: New Zealand Data Sources Relating to Alcohol. The Alcohol Advisory Council of New Zealand, Wellington.
- Warner, Margaret; Smith, Gordon; and Langley, John. (1998) Quality and Completeness of Alcohol Data for Drownings in Coronial Files. Injury Prevention Research Unit, University of Otago Medical School. Dunedin.
- New Zealand Police. (various years). Report of the New Zealand Police. Wellington.
- Land Transport Safety Authority. (various monthly issues). Road Safety New Zealand. Wellington.
- Land Transport Safety Authority. (various years). Motor Accidents in New Zealand. Wellington.
- Ministry of Health. (various years). Progress on Health Outcomes: The State of the Public Health in New Zealand. Wellington.
- Public Health Commission. (various years). Our Health - Our Future: The State of the Public Health in New Zealand. Wellington.

**Table 1:**

**Inventory of Indicators of Alcohol Related Harm**

<b>Alcohol Related Harm</b>	<b>Ideal/Alternative Indicators or Or Surrogates</b>	<b>Potential Data Sources</b>	<b>Potential Organizations/ Agencies</b>	<b>Limitations or Concerns</b>	<b>Potential To Be Reported To Local Communities at Least Annually</b>
<b>1. Drink/Drive Traffic Crashes</b>	Ideal: All crashes in which one driver had been drinking	Blood Alcohol Content (BAC) level of all drivers involved in traffic crashes. Breath BAC measurement on all traffic crash reports.	New Zealand Police	If these data were collected consistently for all crashes, this ideal could be met. Unfortunately the police do not collect a breath sample for all drivers in all crashes at the current moment.	Since there is no consistent breath testing of all drivers in each traffic crash, this ideal is <b>not</b> currently possible.
	Surrogate 1: Blood alcohol content of fatal drivers.	Blood test results of all dead drivers.	Land Transport Safety Authority	Such data, based upon blood tests conducted by hospitals or local coroners, is dependent upon timely testing and testing of all dead drivers.	There is considerable variation in BAC testing of dead drivers across New Zealand. Evidence of inconsistent testing across local areas in NZ makes this currently an unreliable indicator but one which could be achieved to support public policy at national and local levels.
	Surrogate 2: Presumed drink/drive traffic crashes	Indication by the officer of suspected alcohol involvement in the Accident/Incident Form where there is a place to check “alcohol perceived to be present”.	New Zealand Police	Such data are routinely collected but represent judgment on the part of the local police officer who completes the traffic crash report. It is this judgment which causes concern about the reliability of these data.  This indicator could be used if it can be shown to be highly associated over time with actual drink/drive crashes.	Reliable data could potentially be developed. The Land Transport Safety Administration currently undertakes an annual roadside survey of driving information. These data are nationally representative way and includes the BAC levels of drivers. These data are not locally representative. However, they could be used to test the validity (evidence of systematic error) of officer judgment about alcohol involvement. Since the data are

					currently collected by New Zealand police these data could be organized and reported over time to local communities.
	Surrogate 3: Drink/Drive injury crashes	Reports of drink/drive crashes requiring/seeking medical treatment	Accident Compensation Corporation of New Zealand	Since many persons who are involved in drink/drive crashes (especially if a single vehicle crash) may present themselves for medical treatment but not actually report the crash to the police.	This indicator would be a useful alternative surrogate since there is a suggestion that many of road traffic crashes especially involving a single vehicle and often an alcohol impaired driver may not report to the police but to a local emergency department. If there was a consistent reporting of traffic crash AND that alcohol was involved. There would be legal issues and confidentiality issues of reporting alcohol involvement.
<b>2. Alcohol related assaults</b>	Ideal: A direct measure level of drinking for every assault.	The BAC for every assailant and victim in a public or domestic assault is measured.	New Zealand Police (BAC levels at crime scene)	This is an ideal which is not available in any country in the world but is a most desired measure	Not currently feasible.
	Surrogate 1: Drinking levels of assault victims.	The BAC of serious assault cases is collected.	Local hospital emergency departments (ED), trauma centres, and private accident emergency providers for BAC of victims.	This indicator if collected routinely for every assault case would provide valuable data for communities.	The current situation is that local hospital EDs, trauma centres, and private accident emergency providers collect BAC on patients on a very selective basis. Currently local monitoring data would be unreliable. The situation would be improved if at least "serious" cases (such as those requiring over night hospitalization or specific types of emergency care) were consistently tested nation wide.
	Surrogate 2: Police officer assessment of drinking by violent offenders.	Accident/Incident Form completed by police provides for officer assessment if "alcohol perceived as present" and estimation of	New Zealand Police	Data limited by accuracy and consistency of officer judgments.	These data, while limited via its dependency upon officer judgment can be used to provide useful information for communities.

		“level of intoxication”.			
	Surrogate 3: Police Officer assessment of drinking in domestic violence situation by victim and offender.	Police Family Violence Report. Form provides space for officer assessment if either party have been drinking or if alcohol is involved.	New Zealand Police	Data limited by accuracy and consistency of officer judgments. This form is potentially valuable because it is event based, not the basis of criminal charges.	These data, while limited via its dependency upon officer judgment can be used to provide useful information for communities.
	Surrogate 4: BAC level of cases first contacted by Ambulance/First Response personnel.	Emergency vehicle personnel could complete a BAC test or make an estimation of alcohol involvement.	Emergency/First Response organizations throughout New Zealand	BAC breath testing is an issue of cost and policy. Professional estimates of alcohol involvement incur the limitation of judgment.	These data could be collected but issues of cost and policy would be involved.
<b>3a. Alcohol related unintentional non traffic injuries</b>	Ideal: Drinking levels of all cases of unintentional non traffic injuries	The BAC of all injury and trauma cases is collected by hospitals EDs, trauma centres, and private accident emergency providers.	Accident Compensation Corporation. DHBs and other public health /health promotion providers	These data if routinely collected for every injury non-traffic and non assault case would provide an ideal indicator for local communities. BAC data on the most serious trauma cases are recorded. Addition to the ACC form as alcohol or drinking as present (since this is no fault system).	The current situation is that emergency care providers record and/or collect BAC on injury patients on a very selective basis perhaps except for the most serious cases. It may be possible to begin such a local reporting system using current reporting processes and utilizing the new ICD 10 Y91 code for alcohol involvement.
	Surrogate 1: Alcohol-Involved Poisoning cases	Any differential diagnosis of poisoning requires a notification be sent to the Medical Officer of Health as a notifiable event	Ministry of Health DHBs and other public health /health promotion providers	Since poisoning is a DHB notifiable event, these data are available but often collected irregularly., Also, if other conditions are present, the presence of alcohol (as source of poisoning) may be obscured and a required form not filed.	These data, though limited by medical provider practice, could be used at the local level as an indicator of high volume drinking.
<b>3b. Alcohol related unintentional non traffic fatalities</b>	Ideal: Drinking levels of all cases of unintentional non traffic fatalities	Consistent and systematic BAC testing of all fatalities can provide these data	Local coroners.	While such data are available, the victims tested are selected unsystematically	These data if routinely collected for every injury non-traffic and non assault fatality would provide an ideal indicator for local communities. Alternatively BAC data could be collected on a

					consistent and systematic basis via the development and implementation of specific guidelines of testing selection.
	Surrogate 1: Death by Drowning in which alcohol is involved.	BAC data of drowning victims are collected normally but selectively.	Local coroners	While such data are available, the victims tested are selected unsystematically	This indicator, even with its limitations, could be provided to local communities. The data would be greatly enhanced if there were specific guidelines on the selection criteria for cases to test.
<b>4. Youth Possession of Alcohol in Public Places</b>	Ideal: Percentage of all underage youth actually able to purchase alcohol in licensed establishments.	Total number of underage purchases divided by the total number of purchase attempts	National purchase surveys.  ALAC Youth Monitoring Survey	These data are currently available through special surveys as shown to the left are all are samples not complete counts.	The ideal is difficult to achieve.
	Surrogate 1: Percentage of youth able to purchase alcohol based upon surveys.	Counts of purchases over time by young as a part of local "purchase" surveys	Above sources.	All of the studies are based upon sampling designs but few are conducted to represent local areas. Consistent measurement is required and must be routinely implemented.	These sources above could be used if routinely collected on a representative basis for all localities. Cities and local areas under a 100,000 population are not represented in current surveys.
	Surrogate 2: Police citations given to underage youth attempting alcohol purchases.	Number of citations per locality.	New Zealand Police	Counts of citations are a reflection of level of local police enforcement and not necessarily indicative of level of attempts by underage youth in all local areas.	Police Infringement Notice counts are possible for local areas.
	Surrogate 3: Licensed establishments warned about selling alcohol to underage youth.	The percentage of licensed establishments in an area given notice by police for selling alcohol to youth. Reported on Police License Premises Visit Sheet.	New Zealand Police  District Licensing Authorities	Reports of establishments selling alcohol by police or even the DLA reflect the level of surveillance and attention to enforcement but are potentially quite useful.	This is an indicator which could be developed for local areas.
<b>5. Alcohol-related hospitalization</b>	Ideal: alcohol related hospital stays.	Total hospital days for cases in which alcohol (based upon ICD-10) was indicated as being involved.	Hospital admission records	While these ICD codes are often included in hospital admission records, this relies on medical personnel	This indicator could be developed for all local areas in New Zealand. Caution would have to be applied based upon the selectivity of

				correctly selecting and assigning these codes.	medical personnel in including alcohol linked ICD codes. Since all hospital record systems are computerized, a requirement could be applied that no patient is discharged without completing an E code for every case.
6. Alcohol related mortality	Ideal: Alcohol as a contributor to the death	The consistent assessment of alcohol involvement or as a contributor to the death of every death. For mortality related to chronic drinking, ICD codes would be used. For mortality related to acute drinking BAC blood testing of every fatality would be conducted.	New Zealand Health Information Service  Note: inconsistent reporting by hospitals make this difficult or infeasible at the current time. However, if pathology tests were required of all acute non-traffic deaths (falls, burns, drownings, etc.) then consistent and reliable data could be available to communities.	In principle these data are available for every locality within New Zealand. Unfortunately the contribution of alcohol (either for acute or chronic conditions) is selected recorded in the death certificate. BAC testing of fatalities is not currently completed on every fatality.	For chronic deaths, pathology reports, if routinely conducted, would make this feasible along with consistent reporting by physicians in death certificates.  For acute deaths, post mortem pathology BAC levels could be collected. Testing for acute deaths could be based upon application of consistent standards to identify all cases which should be tested.

**Table 2:**

**Inventory of Indicators of Alcohol Related Risk**

<b>Alcohol Related Harm</b>	<b>Ideal/Alternative Indicators or Or Surrogates</b>	<b>Potential Data Sources</b>	<b>Potential Organizations/ Agencies</b>	<b>Limitations or Concerns</b>	<b>Potential To Be Reported By Local Area at Least Annually</b>
<b>1. Per Capita Alcohol Consumption</b>	Ideal: Personal record of alcohol consumed per person annually	Annual survey of alcohol consumption for all persons, 15 years and older.		This ideal represents the perfect recording of all alcohol consumed.	Currently infeasible.
	Surrogate 1: Volume of alcohol sold in licensed alcohol outlets in each local area.	Licensed establishment sales records	Liquor Licensing Authorities or District Licensing Authorities	Such sales records are not currently collected to enable a locally-specific estimate to be derived.	Not currently feasible.
	Surrogate 2: self-reported consumption on surveys	Surveys with sufficient coverage of the local population to provide valid local area estimates	Ministry of Health Public Health Intelligence (PHI)  Household Economic Survey, Statistics New Zealand (only currently records percent of household income spent on alcohol)	Surveys with sufficient local coverage to enable annual estimates of alcohol consumption are not currently available.	
<b>2. Percentage of Youthful Drinkers</b>	Ideal: Personal record of alcohol annually consumed by youth by age group				
	Surrogate 1: self-reported consumption on surveys	Youth surveys with sufficient coverage of the local population to provide valid estimates	MoH PHI Household Economic Survey, Statistics New Zealand (only records percent of household income spent on alcohol)	Surveys with sufficient local coverage to enable annual estimates of alcohol consumption are not currently available.	

<b>3. Number of Heavy Drinking Events</b>	Ideal: Number of drinking events in which at least 5 drinks (males) or 4 drinks (females) are consumed.	Personal record of heavy drinking events			
	Surrogate 1: Self reports of heavy drinking events	National surveys with sufficient cases to allow valid estimates for every locality.	MoH PHI	Surveys with sufficient local coverage to enable annual estimate of alcohol consumption are not currently available.	
<b>4. Percentage of drinking drivers on the roads</b>	Ideal: Level of drinking for all drivers on the road	Measurement of BAC for all drivers			
	Surrogate 1: Distribution of BAC among drivers (not crash involved)	BAC results of all breath tests conducted under Compulsory Breath Testing by police.	New Zealand Police	These data, if made available on a local level, at least quarterly could provide a most valuable indicator of level of drink driving over time in each locality.  A limitation of these data is that CBT is not carried out to obtain a scientifically valid sample of drivers in a community road system.	Currently, these data (time and day and level of BAC) for every driver tested in stored on a chip in the breath testing equipment used in CBT. These data could be downloaded into a data base to develop distributions for BAC by locality. Currently these results of each individual test erased each time the machine is calibrated.
	Surrogate 2: Drink/drive arrests	Arrest Reports for Drivers who have a BAC level equal to or higher than the legal limit.	New Zealand Police	This is a poor indicator of actual drink/drive events since arrest numbers are directly related to the level of local police enforcement.	Indicator is readily available and could be useful as a local indicator if used in conjunction with officer reports of alcohol involvement and other indicators.
	Surrogate 3: Distribution of BAC among drivers	Percentage of drivers on the road by BAC levels in a local area	Land Transport Safety Authority	Annual roadside survey conducted each year with a scientifically valid sample of drivers.	This is a valid sample conducted each year. However, data not representative of local areas and thus not immediately useful.
<b>5. Location and identification of</b>	Ideal: the retail establishment or social location at which	The location where most alcohol was	Police and hospitals ED		This ideal is not possible since police and other reporting are

<b>Licensed Establishments contributing to Heavy Drinking in a local area.</b>	most alcohol was consumed by a person involved in (a) a drink/drive crash, (b) a non traffic injury or fatality, or (c) an alcohol related assault.	consumed.			selective, i.e., persons who have come to their attention.
	Surrogate 1: the Place of Last Drink as recorded as “alcohol indicated” by police.	Indicates retail establishments in a local area where drinking is occurring prior to an arrest as shown on the “Place of Last Drink” report	New Zealand Police	The recording is always subject to the reporting biases of individuals questioned by police and perception of police if alcohol has been involved.	If these data are collected consistently across all police reports, this surrogate can be used to indicate which retail establishments are contributing to drink/drive problems in each local area. Could be implemented immediately.
<b>6. Number and Density of Alcohol Retail Outlets</b>	Ideal: the number and density of alcohol retail outlets in every local area as well as the distribution of alcohol problems.	Counts and geospatial location of every licensed outlet	Liquor Licensing Authority  District Licensing Authorities	In principle this mapping and density determination can be developed for every local area based upon the addresses of every licensed outlet in New Zealand.	Researchers from the Centre for Social & Health Outcomes, Research & Evaluation (SHORE) have demonstrated the feasibility of GIS coding of licensed outlets and alcohol problems in the Auckland area. This would be possible for other local areas as well.
<b>7. Perceived Risk of Drink Drive Arrest</b>	Ideal: Level of perceived risk of arrest of drink/drive for every driver in New Zealand by local area	Reporting by every driver of perceived risk	Land Transport Safety Authority		No locally specific data are currently available.
	Surrogate 1: Level of perceived risk estimated from sampling	National survey	Land Transport Safety Authority	This is an annual national survey of public perception of risk of arrest for drink driving. Not adequate for reporting local data.	If a regular national survey with sufficient sampling to enable valid estimates for all local areas, this measure could be routinely monitored.
	Surrogate 2: level of perceived risk of drivers who are tested during CBT	CBT results of questioning of all tested drivers	New Zealand Police	As the CBT is somewhat representative of the drivers in each local area, then the results of a simple question (as a rating) about likelihood of drink drive detection from each tested driver could be used.	Such a question could be asked of every tested driver but this would require (a) a means to record the answer for each test driver and (b) the willingness of the police to actually ask the question and record the results.

