



# **An Assessment of Data Quality for Examining Alcohol-Related Issues in the Queenstown Lakes District**

Taisia Huckle

Martin Wall

Sally Casswell

June 2012

SHORE & Whariki Research Centre

School of Public Health, Massey University

PO Box 6137, Wellesley Street, Auckland 1141



**MASSEY UNIVERSITY**

ISBN: 978-1-927138-37-3 (print) 978-1-927138-38-0 (online)

Prepared for the Alcohol Advisory Council of New Zealand by:

**Taisia Huckle**

**Martin Wall**

**Sally Casswell**

SHORE and Whariki Research Centre

School of Public Health, Massey University

PO Box 6137, Wellesley Street, Auckland 1141

**Alcohol Advisory Council of New Zealand  
Kaunihera Whakatupato Waipiro O Aotearoa**

**PO Box 5023**

**Lambton Quay**

**Wellington 6145**

**New Zealand**

[www.alac.org.nz](http://www.alac.org.nz)

[www.waipiro.org.nz](http://www.waipiro.org.nz)

**June 2012**

## **Disclaimer**

This report was commissioned by the Alcohol Advisory Council of New Zealand (ALAC) and prepared by Taisia Huckle, Martin Wall and Sally Casswell of SHORE and Whariki Research Centre. The views expressed in this report are those of the authors and do not reflect any official position on the part of ALAC, the Queenstown Lakes District Council or Lakes Environmental Limited.

## **Queries regarding this report**

Any queries regarding this report should be directed to ALAC at:

©Alcohol Advisory Council of New Zealand  
Level 13, Craigs Investment Partners House  
36 Customhouse Quay  
PO Box 5023  
Lambton Quay  
Wellington 6145  
New Zealand  
Phone: +64 4 917 0060  
Fax: +64 4 473 0890  
[central@alac.org.nz](mailto:central@alac.org.nz)

## **Acknowledgements**

We would like to acknowledge the generous contributions of Lee Webster, Lakes Environmental and other Queenstown Lakes District Council members to this project. We would like to acknowledge Craig Gordon, Cathy Bruce and Margaret Chartres from ALAC. Thank you to the stakeholders in Queenstown who generously gave their time; also to others consulted during the process, including the New Zealand Police, St John, the Southern District Health Board, the Ministry of Health, the Ministry of Justice and the Liquor Licensing Authority.

## Contents

Executive summary .....	1
1.0 Introduction .....	4
1.1 The importance of trading hours .....	4
1.2 The Queenstown Lakes District and trading hours .....	5
1.3 The feasibility study .....	6
1.4 Assessing the data .....	6
2.0 Objective 1: Alcohol-related data in Queenstown.....	8
2.1 Scoped datasets.....	8
2.2 Calculations undertaken as part of data scoping .....	11
3.0 Objective 2: Assessing trading hours.....	14
3.1 Can trading-hours changes be assessed?.....	14
4.0 Objective 3: Harms over time in the Queenstown Lakes District.....	16
4.1 Interim step .....	16
4.2 Queenstown .....	17
4.3 Wanaka.....	18
5.0 Objective 4: Into the future .....	20
5.1 Next steps.....	20
5.2 Trading-hours changes in the future (Objective 2) .....	20
5.3 Harms over time in the Queenstown Lakes District in the future (Objective 3).....	21
6.0 References .....	23
Appendix 1: Detailed data scoping.....	25
Appendix Two: Analysis of statistical power.....	38

## List of Tables

Table 1: Summary of data scoping findings for Queenstown.....	12
Table 2: Summary of data scoping findings for Wanaka .....	13



## **Executive summary**

The international research evidence suggests that changing the trading hours of licensed premises can alter levels of alcohol-related problems and outcomes (Babor et al., 2010).

In the Queenstown Lakes District in 1999 the licensing policy was changed in a liberal direction to allow 24-hour trading for all outlets in the district. However, in 2003 this policy was modified to permit 24-hour opening for central Queenstown only. In the rest of the district, outlets were not allowed to trade after 2.30am. In 2007, a 4.00am closing time was imposed in central Queenstown.

The reduction of trading hours in the Queenstown Lakes District, including the 4.00am closing time introduced in 2007 for Queenstown, was in response to increasing concerns about the level and seriousness of alcohol-related violence, alcohol-related social disorder and antisocial behaviour in the Queenstown Lakes District.

Following the introduction of the liquor policy to reduce trading hours to 4.00am in the Queenstown Lakes District, the liquor policy was unsuccessfully challenged through the judicial system to the Court of Appeal, in addition to Liquor Licensing Authority (LLA) hearings involving licensed premises that wished to trade past 4.00am.

The Queenstown Lakes District Council sought support from the Alcohol Advisory Council of New Zealand (ALAC) regarding the appeal and LLA hearings. ALAC subsequently agreed to support a feasibility study in Queenstown to assess if there are sufficient data and information to examine the relationship between hours of operation and alcohol-related offences and problems.

The specific objectives of the feasibility study were to examine:

- 1) The availability and robustness of data and information to assess alcohol-related issues in the Queenstown Lakes District.
- 2) Whether, or to what degree, data and information can be used to assess if any alcohol-related issues are influenced by changes to opening hours that have occurred in the Queenstown Lakes District in the past.
- 3) Whether, or to what degree, data and information can be used to assess harms more generally over time in the Queenstown Lakes District.

- 4) Any necessary improvements to data and information collection to enable Lakes Environmental Limited and the Queenstown Lakes District Council to be in a better position to assess policy or regulation changes in the future.

The two areas of interest in the Queenstown Lakes District, with respect to this project, were Queenstown and Wanaka. Both are very popular tourist destinations, particularly Queenstown.

The following datasets were scoped as part of Objective 1: the Police Communications and Resource Deployment (CARD) database, offences by Police station (Official Police Statistics), Alco-Link data (Police intelligence data), the Police Family Violence Incident Report (Poll-VFIR), traffic crash data, Lakes District Hospital Emergency Department (ED) data, hospitalisation data, ambulance call-outs, noise control complaints and population estimates (particularly important in areas that swell with tourists at different times of the year, as Queenstown and Wanaka do).

The data-scoping process from Objective 1 revealed that it is not currently possible to undertake Objective 2, an assessment of trading-hour changes that have occurred in the past in the Queenstown Lakes District. This assessment is based on the number of events in the datasets and the number of years of consistent data available, and an assessment of the statistical power required (the ability to detect significant changes in data available).

Suitable alcohol-related data do exist to address Objective 3, tracking trends in harms more generally, from 2005 onwards. However, we recommend an interim step for the Queenstown Lakes District to consider first and that is to assess the accuracy, consistency and coverage of the population estimates available for Queenstown and Wanaka. Population estimates are needed to standardise the alcohol-related data from one year to the next, and using inaccurate or inconsistent population estimates may produce spurious results.

Several sources of population estimates need to be synthesised in Queenstown and Wanaka in order to obtain estimates of the populations in these two sites. This is because in both of these regions the resident population is swollen by tourists and seasonal workers, not adequately captured under Census data. While we did scope these different sources of population estimates (outlined in the report), obtaining the data was outside the reach of this feasibility project.

If it is determined that population estimates for these areas are accurate, we would recommend the following datasets for collection for Objective 3 (at baseline and ongoing into the future): for Queenstown, the Police CARD, Lakes District Hospital ED data, offences by Police station



(Official Police Statistics) and population estimates; and for Wanaka, offences by Police station (Official Police Statistics) and population estimates.

Recommendations for the Queenstown Lakes District Council to consider in the future with respect to alcohol-related issues were included under Objective 4. The Queenstown Lakes District Council may wish to consider the following: undertaking work to validate population estimates in Queenstown and Wanaka, maintaining the excellent relationships it has with Police and other stakeholders regarding alcohol-related issues, and undertaking a specifically designed research project if assessments of the impacts of trading-hour changes are wanted in the future (Objective 2). With respect to Objective 3, if it is determined that accurate population estimates are available, the Queenstown Lakes District Council may like to consider building relationships with data holders and working with the Lakes District Hospital ED regarding the systematic identification of alcohol involvement in the ED setting.

## **1.0 Introduction**

### **1.1 The importance of trading hours**

Although there have been no published studies conducted in New Zealand assessing the impacts of changes in trading hours nationally or otherwise, international research suggests that changes in trading hours can affect levels of alcohol-related harm and problems such as offending.

A recent review of the international literature included studies from eight countries across four decades that used a mix of study designs (Stockwell & Chikritzhs, 2009). Based on the most reliable studies, the authors reported that 79% of the studies found that changes in trading hours affected at least one outcome measure. Acute harms (closely associated in time with drinking events) were most likely to change compared with more chronic problems such as liver cirrhosis.

Chikritzhs and Stockwell (2006; 2007) found that the extension of trading hours in Western Australia from midnight to 1am resulted in significant increases in alcohol-impaired driver crashes, along with higher breath alcohol content levels for male drivers aged 18-25 years. This may have been an indication of characteristics specific to clientele of hotels who applied for the hour's extension. Approximately 45 hotels across Western Australia extended their hours between 1993 and 1997.

Chikritzhs and Stockwell (2002), Perth, Australia examined the impacts of later trading hours for licensed hotels on levels of violent assault on or near these premises. There was a significant increase in monthly assault rates for hotels with late trading. Greater numbers of patrons and increased levels of intoxication contributed to the observed increase in violence (Popova et al., 2009).

Vingilis et al. (2007) looked at extended trading hours from 1am to 2am for licensed premises in Ontario and found significant increases in injuries presenting to Ontario trauma units.

Other studies found no effect of changes in trading hours; for example, Vingilis et al. (2005) found little impact on alcohol-positive fatalities with the extension of the closing hours by one hour in Ontario. However, in this case many licensed establishments chose not to change their trading hours, meaning that the change in availability of alcohol was small. It was also possible that drinking and driving rates were reduced owing to road safety initiatives (Vingilis et al., 2005), as a similar study by the same author in Ontario did find increases in injuries (Vingilis et al., 2007).

Overall, the international research evidence suggests that changing the trading hours of licensed premises can alter levels of alcohol-related problems and outcomes (Babor et al., 2010).

## **1.2 The Queenstown Lakes District and trading hours**

The Queenstown Lakes District is one of New Zealand's most popular tourist destinations and swells with tourists at certain times of the year. Queenstown and Wanaka (the two areas of interest for this project) have compact central business districts, particularly so in Queenstown where bars and nightclubs are prolific and located in close proximity to one another.

In recent years there has been a trend to liberalise days and hours of sale both overseas and in New Zealand (Babor et al., 2010). In New Zealand, changes to the 1989 Sale of Liquor Act (implemented in April 1990) permitted longer trading hours for on- and off-licensed premises, including 24-hour trading.

In the Queenstown Lakes District in 1999 the licensing policy was changed in a liberal direction to allow 24-hour trading for all outlets in the district (previously some were not permitted to trade 24-hourly). However, in 2003 this policy was modified to permit 24-hour opening for central Queenstown only. In the rest of the district, outlets were not allowed to trade after 2.30am.

In 2007 a 4am closing time was introduced for Queenstown. There was anecdotal evidence that most alcohol-related offending took place between 10pm and 6am (Queenstown Lakes District Council & Ministry of Justice, 2007). Anecdotal evidence also suggested that drinkers were migrating to the premises open last in order to continue drinking when other bars and nightclubs had closed. Queenstown, in particular, has a very compact central business district that facilitates the movement of patrons from bar to bar very easily.

The most recent trading-hour change affecting central Queenstown (in 2007 from 24-hour to 4am trading) resulted in 17 bars and nightclubs reducing their hours (of approximately 180 premises, of which around 60 appear to be bars). Although this is not a large number of bars that reduced their hours, Queenstown is viewed as a party town by some and the 17 premises in question are clustered. This may have a magnifying effect. It is also possible that these premises are associated with a relatively large proportion of harm, as patrons flood into these premises once others close.

### **1.3 The feasibility study**

Following the introduction of the liquor policy to reduce trading hours to 4am in the Queenstown Lakes District, the liquor policy was unsuccessfully challenged through the judicial system to the Court of Appeal, in addition to Liquor Licensing Authority (LLA) hearings involving licensed premises that wished to trade past 4am. The Queenstown Lakes District Council sought support from the Alcohol Advisory Council of New Zealand (ALAC) regarding the appeal and LLA hearings. ALAC subsequently agreed to support a feasibility study in Queenstown to assess if there were sufficient data and information to examine the relationship between hours of operation and alcohol-related offences and problems.

The aim of the feasibility study was focused on data scoping and assessing the feasibility of using routinely collected data from the Queenstown Lakes District (specifically the Queenstown and Wanaka areas) to assess associations between changes in trading hours and offences and harms. Data were also assessed with a view to assessing harms and offences more generally over time (not specifically in relation to trading hours). The specific aims of the feasibility study were to examine:

- 1) The availability and robustness of data and information to assess alcohol-related issues in the Queenstown Lakes District.
- 2) Whether, or to what degree, data and information can be used to assess if any alcohol-related issues are influenced by changes to opening hours that have occurred in the Queenstown Lakes District in the past.
- 3) Whether, or to what degree, data and information can be used to assess harms more generally over time in the Queenstown Lakes District.
- 4) Any necessary improvements to data and information collection to enable Lakes Environmental Limited and the Queenstown Lakes District Council to be in a better position to assess policy or regulation changes in the future.

### **1.4 Assessing the data**

When assessing the alcohol-related data in the Queenstown Lakes District, several key considerations were taken into account:

- (i) Data were required to be as consistent over time as possible, with no changes in data collection or reporting practices that impacted on the ability of the data to be used.

(ii) Large enough numbers were required to be able to conduct a reliable statistical analysis. As numbers get smaller, confidence in their accuracy is reduced. Rates based on large numbers typically provide stable, accurate estimates, whereas rates based on small numbers do not as they can fluctuate dramatically from year to year (and are highly influenced by random variation). Small numbers are not good for undertaking statistical analysis.

(iii) The number of data points (annually/monthly) in the available datasets was also an important consideration; for example, were there enough data points before and after the trading-hour changes to be able to assess impacts adequately? (Calculations were conducted with respect to this and are addressed under Objective 1.)

(iv) Data that reflected acute harms with times of the events attached were likely to be particularly useful for assessing trading-hour changes. Events that could be placed in geographical space were also useful i.e. events that were geocoded or had address information attached to events.

(v) Also, when dealing with routinely collected data, proxy measures of alcohol involvement are often used. This is because data collected by agencies do not always have alcohol involvement systematically recorded (although some do). Proxy measures are commonly used in alcohol research and are based on extensive evidence showing that, for example, high proportions of people arrested for disorder offending or assault have been consuming alcohol or are intoxicated. Or, for example, that Friday and Saturday nights are those nights with the highest proportions of alcohol-affected patients in emergency departments (Babor et al., 2010; Young et al., 2004).

## **2.0 Objective 1: Alcohol-related data in Queenstown**

The first objective of the feasibility study was to scope different sources of alcohol-related data in the Queenstown Lakes District and assess them with respect to availability and robustness.

The scoping process included assessments of several questions outlined here as: the usefulness of the data as a measure of alcohol-related harm and specifically for measuring changes related to trading hours, coverage and consistency of the data over time, whether the data were available i.e. could be requested, the process to gain access to the data, and the effort involved for the Queenstown Lakes District Council to obtain the data. With respect to assessing the usefulness of the data for statistical analysis, the number of events in each dataset was considered, as were the number of data points available (all results can be found in Appendix 1 – including recommended actions for Objectives 2 and 3 and any proposed future action that the Queenstown Lakes District Council may like to consider). The summary is found below.

### **2.1 Scoped datasets**

#### *2.1.1 Communications and Resource Deployment database*

The Communications and Resource Deployment (CARD) database records all Police events i.e. responses to 111 calls and vehicle stops, whether or not they lead to arrests. Events are coded/categorised in the database. Offences that are alcohol related, such as disorder, violence and assault, can be selected from these data.

#### *2.1.2 Offences by Police station (Official Police Statistics)*

For each Police district, records are kept of the number of apprehensions and prosecutions for offences. Offences are recorded under seven offence categories e.g. ‘violent offences’, each of which is divided into a number of classes e.g. violent offences include homicide, kidnapping and abduction, robbery, grievous assaults and so on, and each of these is divided into a number of offence types e.g. grievous assaults is divided into wounding with intent, injuring with intent, assault with weapon and so on.

### *2.1.3 Alco-Link*

Since 2005 Police officers have recorded on charge sheets and traffic offence notices whether the apprehended offenders had been drinking, their estimated level of intoxication (nil, slight, moderate, extreme) and where they had had their last drink.

### *2.1.4 Police Family Violence Incident Report – Poll-FVIR (was POLL400)*

The Poll-FVIR is utilised by Police to collect data on family offences with alcohol involvement recorded.

### *2.1.5 Crash data*

The NZ Transport Agency manages the Crash Analysis System (CAS), which records all crashes by level of severity and causative factors.

### *2.1.6 Lakes District Hospital Emergency Department data*

Data on emergency department (ED) presentations are kept by the Lakes District Hospital. Time of attendance, reason for attendance and demographic information including age of patient are collected. ED presentation data are available electronically. However, an indicator of alcohol involvement is not available electronically within the dataset. Presentations are ICD coded (the International Statistical Classification of Diseases and Related Health Problems is a standardised coding system for diseases and related health problems).

### *2.1.7 Hospitalisation data*

The National Minimum Dataset (NMDS) contains data on all inpatient stays in New Zealand hospitals, both public and private. It includes patients who had initially arrived at EDs but whose condition was serious enough to require more than three hours' treatment (waiting time and triage are not included in the three hours). Patients who die whilst in the ED are also included in the NMDS. The National Non-Admitted Patient Collection (NNPAC) collects data on outpatients and ED patients discharged before three hours. The NNPAC is a much more recent dataset with less information.

### *2.1.8 Ambulance call-outs*

Data on call-outs (where the ambulance is deployed) for ambulance services include location, time and type of incident (including alcohol poisoning, assaults and falls).

### *2.1.9 Noise control complaints*

Data on noise control complaints within the central business district that are related to licensed premises.

### *2.1.10 Population estimates*

Accurate population data for Queenstown are necessary to act as a denominator when measuring rates and to help make sense of the data. This is especially important for this region, where the resident population is swollen by both tourists and seasonal workers.

### *2.1.11 Summary*

The full descriptions and assessments of the data scoped can be found in Appendix 1. Tables 1 and 2, however, show a summary of findings from the data scoping for Queenstown and Wanaka (the two areas of interest for this project in the Queenstown Lakes District).

Most of the consistent data sources are available from 2005 onwards (Table 1). While some consistent data sources are available before 2005 i.e. traffic crash data and hospitalisation data (NMDS), the number of events is small in these datasets in Queenstown. As numbers get smaller, confidence in their accuracy is reduced and as such they are not good for undertaking statistical analysis<sup>1</sup>.

While numbers of events annually were reasonable for CARD and ED data, Official Police Statistics and Alco-Link, these data sources did not have many data points annually (while breaking down the data to a monthly basis would have increased the number of data points, numbers were very small based on monthly events and not good for undertaking statistical analysis).

The findings for Wanaka were similar to those for Queenstown in terms of the different data that are available and from when they are available. Wanaka, however, is a much smaller area and as such numbers of events in datasets are small.

---

<sup>1</sup> The National Minimum Dataset is available before 1995; however, a coding change in 1995, ICD-9-CM to ICD-9-CMA-II, affected the comparability of the data. A further coding change occurred in 1999 (ICD-9 to ICD-10); please note that data are only consistent over time (from August 1995) if the coding change in 1999 is addressed.



## **2.2 Calculations undertaken as part of data scoping**

Calculations were undertaken using ED data and Official Police Statistics (disorder) to determine if there was a sufficient number of events and data points to be able to detect a statistically significant change in alcohol-related events over time (assuming that a policy change had occurred). Calculations were undertaken for Queenstown, the location with the largest number of events, and were done based on monthly events and annual events.

### *2.2.1 Monthly*

Assessing these data sources monthly showed that numbers were too small to be able to detect a significant change in events over time (if disorder offences were to fall to zero this would still be within the random variation and hence could not be attributed to a change in the environment).

### *2.2.2 Annually*

For annual measures, even though the number of events was reasonable for disorder offences and ED presentations, the calculations showed that many years of data were required before and after a policy change to be able to detect a realistic change in the number of events as significant.

For example, to be able to detect a decrease of 40 events in ED presentations (from a total of 600), eight years of data would be required before the change and eight years following. For disorder data, results were similar. This means that with only a few years of consistent data, as is the case in Queenstown i.e. from 2005 onwards, very large/unrealistic changes in the number of events are required before they become statistically significant (please see Appendix 2 for further details).

**Table 1: Summary of data-scoping findings for Queenstown**

	Consistent data	Number of events annually	Number of events monthly	Enough data points before and after changes	Time of event	Location of event	Alcohol - involvement specifically identified
CARD	2005 onwards	Reasonable	Very small	No	Yes	Yes	No
Official Police Statistics	2005 onwards	Reasonable	Very small	No	-	No	No
Alco-Link	2005 onwards	Reasonable	Very small	No	Yes	Location of last drink	Yes
Poll-FVIR (family violence)	Not consistent	-	-	-	-	-	-
Traffic crash data	2000 onwards (at least)	Small	Very small	Yes	-	-	Yes
Emergency Department data	2005 onwards	Reasonable	Very small	No	Yes	No	No
Alcohol-related hospitalisation data (National Minimum Dataset)	1995-2000 ICD-9 2000 onwards ICD-10	Small	Very small	Yes	Yes	Location where patient lives	Yes
Alcohol-related hospitalisation data (National Non-Admitted Patient Collection)	2007 onwards	Small	Very small	No	Yes	-	No
Ambulance call-outs	2006 onwards	Small	Very small	No	Yes	Yes	No
Noise control complaints	2008 onwards	Very small	Very small	No	Yes	Yes	No
Population estimates (including seasonal estimates)	2004 onwards	-	-	-	-	-	-

**Table 2: Summary of data-scoping findings for Wanaka**

	Consistent data	Number of events annually	Number of events monthly	Enough data points before and after changes	Time of event	Location of event	Alcohol - involvement specifically identified
CARD	2005 onwards	Small	Very small	No	Yes	Yes	No
Official Police Statistics	2005 onwards	Small	Very small	No	-	No	No
Alco-Link	2005 onwards	Small	Very small	No	Yes	Location of last drink	Yes
Poll-FVIR (family violence)	Not consistent	-	-	-	-	-	-
Traffic crash data	2000 onwards (at least)	Small	Very small	Yes	-	-	Yes
Emergency Department data	2005 onwards	Reasonable	Very small	No	Yes	No	No
Alcohol-related hospitalisation data (National Minimum Dataset)	1995-2000 ICD-9 2000 onwards ICD-10	Small	Very small	Yes	Yes	Location where patient lives	Yes
Alcohol-related hospitalisation data (National Non-Admitted Patient Collection)	2007 onwards	Small	Very small	No	Yes	-	No
Ambulance call-outs	2006 onwards	Small	Very small	No	Yes	Yes	No
Noise control complaints	2008 onwards	Very small	Very small	No	Yes	Yes	No
Population estimates (including seasonal estimates)	2004 onwards	-	-	-	-	-	-

### **3.0 Objective 2: Assessing trading hours**

The Queenstown Lakes District has been through several trading-hour changes in the past. In 1999 the licensing policy was changed to allow 24-hour trading for all outlets in the district. In 2003 this policy was modified to allow 24-hour trading for central Queenstown only. In the rest of the district outlets were not allowed to trade after 2.30am. In 2007 a 4am closing time was imposed in central Queenstown.

#### **3.1 Can trading-hours changes be assessed?**

The data-scoping process revealed that it is not currently possible to assess the effects of trading-hours changes that occurred in the past in the Queenstown Lakes District using routinely collected data.

With respect to the trading-hours changes that occurred in 1999 and 2003, few datasets existed back in time with enough numbers of events to undertake an analysis of these changes. Although not documented in Table 1, there was one data source that went back in time with a reasonable number of events: Official Police Statistics. Official Police Statistics were available from 1994 onwards, but were not consistent over time, with a change to the Police computer system in 2005 resulting in increases in offences recorded (by around 5% to 10%). Lakes Environmental wished to know if these data could still be utilised. These data could be modelled with a break point at 2005 so as to measure the trend before the computer system change in 2005 and then following; however, we would have to impose some assumptions about the rate of increase of the events before and after the computer system change in 2005, which if incorrect could produce spurious results (not ideal when trying to evaluate a policy change).

Several datasets exist from 2005 onwards that have consistent data and a reasonable number of events in Queenstown (including CARD, ED presentations and Official Police Statistics). This may have meant that the 2007 trading-hours change from 24 hours to 4.00am could be assessed in Queenstown. However, calculations undertaken as part of the data scoping showed that the number of events in the datasets, combined with the small number of years of consistent data, meant that assessing this change in trading hours was not feasible (as very large/unrealistic changes in the number of alcohol-related events were required before they became statistically significant).

**Recommendation:**

As a result of the lack of consistent data with a sufficient number of events, before 2005, it is recommended that an analysis of trading hours not currently proceed.

**Proposed future action:**

If trading-hours changes occur in the future, consider undertaking a specifically designed study to assess the impacts (see Objective 4 for further information).

## **4.0 Objective 3: Harms over time in the Queenstown Lakes District**

One of the objectives of the feasibility study was to assess if there was sufficient, and robust, data to track trends in harms and offences more generally in the Queenstown Lakes District to inform a wider assessment of alcohol-related issues (both now and in the future). Following data scoping it was determined that, from 2005 onwards, suitable alcohol-related data do exist to address this objective. However, we recommend an interim step for the Queenstown Lakes District to consider first.

### **4.1 Interim step**

We recommend firstly that the Queenstown Lakes District Council consider a piece of work to assess the accuracy, consistency and coverage of the population estimates available for Queenstown and Wanaka. Accurate population estimates are required to change the number of events, for example ED presentations, into rates and this is done by using estimates of population. Rates are necessary to standardise the alcohol-related data from one year to the next. If population estimates are not accurate from one year to the next, this can affect trends in the data, once transformed into rates, and produce spurious results.

This issue is particularly important in the Queenstown Lakes District as it is a tourist destination, and although the Queenstown Lakes District has only 23,000 permanent residents (2006 Census) the population is swollen by both the large number of tourists the area attracts and seasonal workers in the hospitality sector. In 2010, there were more than 2.5 million guest nights in the Queenstown Regional Tourism Area. The area is a centre for outdoor activities and attracts many younger visitors (32% of domestic and 46% of international visitors to Queenstown are aged between 15 and 35) (Queenstown Lakes District Council & Ministry of Justice, 2007; Tourism Strategy Group, 2011). At the height of the season visitors outnumber residents by two to one.

Several sources of population estimates exist in the Queenstown Lakes District, including Census data on the usually resident population and the Commercial Accommodation Monitor (tourists staying in hotels and commercial accommodation). The Queenstown Lakes District Council Policy and Planning department may have more detailed information on seasonal workers and visitors in non-commercial accommodation, as this underlies the planning projections made to inform council strategy (Queenstown Lakes District Council; Rationale

Limited, 2011). The Tourism Strategy Group has information on both international and domestic visitors drawn from travel surveys.

We recommend that these data sources be obtained and synthesised, and that in-depth discussions with the agencies that collect the data occur to ascertain the accuracy, consistency and limitations of these data. Assessing if any groups of tourists are missing from the data will also be necessary. While we did scope these data sources, obtaining the data was outside the reach of the feasibility project.

### **Recommendation:**

Consider undertaking a piece of work to ascertain the accuracy, consistency over time and coverage of these different sources of population estimates in the Queenstown and Wanaka areas.

If it is determined that the available population estimates are accurate, we recommend the following datasets for collection at baseline and ongoing into the future (that is, the first step would be to obtain baseline measures of each of the recommended alcohol-related datasets; once obtained, estimates can be updated when desired in the future).

The recommendations below are separated for Queenstown and Wanaka; Queenstown is dealt with first.

## **4.2 Queenstown**

### **4.2.1 CARD database**

The CARD database records all Police events i.e. responses to 111 calls and vehicle stops, whether or not they lead to arrests, and are coded/categorised in the database. For further details on which events are included in CARD data, please see Appendix 1.

The CARD database is the most comprehensive database the Police currently have and comprises responses to 111 calls with the public initiating the response (not always the Police). Data are available from 1 June 2005. Data are consistent over time. We recommend obtaining these data from 2005 onwards. Trends in overall offences and various types of alcohol-related offence such as disorder, violence and assault can be tracked over time.

### **4.2.2 Offences by police station (Official Police Statistics) – disorder and assaults**

For each Police district, records are kept of the number of apprehensions and prosecutions for offences. These data can be requested at the level of Police station (Queenstown station).

Disorder offences and assaults (including minor, serious and grievous) are recommended for use. Although alcohol involvement is not recorded in these offence data, disorder offending and assaults have high proportions of offenders who have been drinking or are intoxicated (Babor et al., 2010). Owing to a Police computer change affecting data, it is recommended that data are obtained from August 2005 onwards.

#### *4.2.3 Lakes District Hospital ED data*

Presentations at Lakes District Hospital ED are recorded, and time of attendance, reason for attendance and demographic information including age of patient; presentations are collected and ICD coded. We recommend obtaining ED data for Friday and Saturday nights, from 2005 onwards, as a proxy for alcohol involvement (to avoid the issue of not being able to obtain reliable information on alcohol involvement in ED presentations) (for more information about this please see Appendix 1). Friday and Saturday nights are likely to have the highest proportions of alcohol-affected patients relative to other nights (Babor et al., 2010; Young et al., 2004). These data include patients from Queenstown and the wider Queenstown area.

#### *4.2.4 Population estimates*

Accurate population data for Queenstown are necessary to act as a denominator when measuring rates and to help make sense of the data. We recommend obtaining population estimates for 2005 onwards (for further details see Appendix 1).

### **4.3 Wanaka**

#### *4.3.1 Offences by police station (Official Police Statistics) – disorder and assaults*

For each Police district, records are kept of the number of apprehensions and prosecutions for offences. These data can be requested at the level of Police station (Wanaka station). Disorder offences and assaults (including minor, serious and grievous) are recommended for use. However, we recommend combining these categories for analysis to increase the number of events to be more reliable for analysis. Given that the July 2005 change in the Police computer system affected data, we recommend collecting data from August 2005 onwards.



### *4.3.2 Population estimates*

Accurate population data for Wanaka are necessary to act as a denominator when measuring rates and to help make sense of the data. We recommend obtaining population estimates for 2005 onwards (for further details see Appendix 1).

## **5.0 Objective 4: Into the future**

The final objective of the feasibility study was to identify areas for the Queenstown Lakes District Council to consider with respect to alcohol-related data in this district, including ways in which systems could be implemented to help assess policy and regulation changes in the future.

Below are recommendations for consideration for next steps:

### **5.1 Next steps**

We recommend that the Queenstown Lakes District Council consider undertaking a piece of work to assess the quality, consistency and coverage of population estimates for Queenstown and Wanaka. This would require obtaining the data sources, combining them, and undertaking in-depth discussions with the agencies that collect the data to ascertain their accuracy and limitations and to determine consistency over time. Assessing if any groups of tourists are missing from the data will also be necessary.

We recommend that Lakes Environmental and the Queenstown Lakes District Council continue with their communication and relationships with the Police and other key stakeholders in the Queenstown Lakes District. Lakes Environmental has excellent relationships with stakeholders in the area, and a high level of commitment about alcohol-related issues among stakeholders has been seen throughout this project. Such a network enables the Queenstown Lakes District Council to have the most up-to-date anecdotal evidence about alcohol-related issues in the district.

### **5.2 Trading-hours changes in the future (Objective 2)**

If trading-hours change in the future, we recommend that a specifically designed study be devised to assess the impacts. For example, an exit breathalyser study, testing the breath alcohol levels of patrons exiting premises or in the central business district before and after trading-hours changes, could be undertaken. This type of survey has been conducted in the Auckland central business district previously (SHORE & Whariki, 2005). This is a higher-cost option; however, there are considerable limitations with using routinely collected data in this area for such a task.

### **5.3 Harms over time in the Queenstown Lakes District in the future (Objective 3)**

If it is determined that accurate population estimates are available, we suggest that the Queenstown Lakes District Council also consider the following with respect to Objective 3.

We recommend that the Queenstown Lakes District Council consider building formal relationships with data holders in organisations such as the Police, Lakes District Hospital ED and Southern District Health Board to build trust with respect to future data access (data access requests in the future will be made on the council's behalf). Relationship building is likely to be especially important if ongoing data are wanted.

There may be an opportunity for the Queenstown Lakes District Council to work with the Lakes District Hospital ED regarding the systematic collection of alcohol involvement in ED presentations in its electronic database, possibly by adding a compulsory box on the computerised triage form regarding alcohol involvement. This would mean that actual alcohol-related presentations could be used instead of the proxy measure of presentations on Friday and Saturday nights.

A national project is currently underway with District Health Boards to develop and implement data collection and analyses of alcohol-related harm data, including alcohol-related presentations to EDs. This is being undertaken by the Accident Compensation Corporation and the Ministry of Health (ALAC is also involved in the project team). Consulting this group may be of use.

## Recommendations

1. That the Queenstown Lakes District Council consider undertaking a piece of work to ascertain the accuracy, consistency over time and coverage of the different sources of population estimates in the Queenstown and Wanaka areas.
2. If it is determined that accurate population estimates are available, we suggest that the Queenstown Lakes District Council also consider the following for tracking trends more generally over time:

For Queenstown, it is recommended that the following be obtained:

- CARD data from 2005 onwards
- ED data for Friday and Saturday nights, as a proxy for alcohol involvement, from 2005 onwards
- Official Police Statistics from August 2005

For Wanaka, it is recommended that Official Police Statistics be obtained from August 2005.

3. That the Queenstown Lakes District Council consider building formal relationships with data holders in the relevant organisations.
4. There may be an opportunity for the Queenstown Lakes District Council to work with the Lakes District Hospital ED regarding the systematic collection of alcohol-involvement in ED presentations within the hospitals' electronic database.
5. If trading-hours change in the future, we recommend that a specifically designed study be devised to assess the impacts.

## 6.0 References

- Allan & Clarke, Axist Consulting, & SHORE. (2008). *The Impact of Enforcement On Intoxication and Alcohol-Related Harm*. Axist Consulting, Allen & Clarke and Centre for Social & Health Outcomes Research and Evaluation. Auckland.
- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., . . . Homel, R., et al. (2010). *Alcohol: No Ordinary Commodity Research and Public Policy* (2nd ed.). Oxford: Oxford University Press.
- Cameron, M., Cochrane, W., McNeill, K., Melbourne, P., Morrison, S. L., & Robertson, N. (2010). *The impacts of liquor outlets in Manukau City: Summary report*. Wellington, New Zealand: Alcohol Advisory Council of New Zealand.
- Chikritzhs, T., & Stockwell, T. (2002). The impact of later trading hours for Australian public houses (hotels) on levels of violence. *Journal of Studies on Alcohol*, *63*, 591-599.
- Chikritzhs, T., & Stockwell, T. (2006). The impact of later trading hours for hotels on levels of impaired driver road crashes and driver breath alcohol levels. *Addiction*, *101*, 1254-1264.
- Chikritzhs, T., & Stockwell, T. (2007). The impact of later trading hours for hotels (public houses) on breath alcohol levels of apprehended impaired drivers. *Addiction*, *102*, 1609-1617.
- New Zealand Transport Agency. (2010). *Briefing Notes Road Safety Issues: Queenstown Lakes District*. Wellington: New Zealand Government Retrieved from <http://www.nzta.govt.nz/resources/road-safety-issues/queenstown-lakes/2010.pdf>.
- Popova, S., Giesbrecht, N., Bekmuradov, D., & Patra, J. (2009). Hours and days of sale and density of alcohol outlets: Impacts of alcohol consumption and damage: A systematic review. *Alcohol and Alcoholism*, *44*(5), 500-516.
- Queenstown Lakes District Council. *Council Community Plan 2009-19: Growth forecasts*. Queenstown: Retrieved from [http://www.qldc.govt.nz/images/Files/TenYear\\_Plans/LTCCP\\_2009-19\\_volume\\_4.pdf](http://www.qldc.govt.nz/images/Files/TenYear_Plans/LTCCP_2009-19_volume_4.pdf).
- Queenstown Lakes District Council, & Ministry of Justice. (2007). *Queenstown Lakes District Project CARV: (Curbing Alcohol-Related Violence): Needs Analysis*. Retrieved from [http://www.qldc.govt.nz/annual\\_plans/file/3233](http://www.qldc.govt.nz/annual_plans/file/3233).
- Rationale Limited. (2011). *QLDC Growth projections March 2011*. Arrowtown, New Zealand: Queenstown-Lakes District Council.
- SHORE & Whariki. (2005). *Auckland Regional Exit Breath Survey 2005*. Auckland: Centre for Social and Health Outcomes Research and Evaluation (SHORE) & Te Ropu Whariki, Massey University.
- Stockwell, T., & Chikritzhs, T. (2009). Do relaxed trading hours for bars and clubs mean more relaxed drinking? A review of international research on the impacts of changes to permitted hours of drinking. *Crime Prevention and Community Safety: An International Journal*, *11*, 171-188.
- Tourism Strategy Group. (2011). Queenstown RTO: Tourism statistics Retrieved 3 March 2011, from <http://www.tourismresearch.govt.nz/By-Region/South-Island/Queenstown-RTO/>
- Vingilis, E., McLeod, A., Seeley, J., Mann, R., Beirness, D., & Compton, C. (2005). Road safety impact of extended drinking hours in Ontario. *Accident Analysis & Prevention*, *37*, 549-556.
- Vingilis, E., McLeod, A., & Stoduto, G., et al. (2007). Impact of extended drinking hours in Ontario on motor-vehicle collisions and non-motor-vehicle collision injuries. *Journal of Studies on Alcohol and Drugs*, *68*, 905-911.
- Young, D., Stockwell, T., Cherpitel, C., Ye, Y., MacDonald, S., Borges, G., & Giesbrecht, N. (2004). Emergency Room Injury Presentations as an Indicator of Alcohol-Related

Problems in the Community: A Multilevel Analysis of an International Study. *Journal of Studies on Alcohol*, 65, 605-612.

## **Appendix 1: Detailed data scoping**

This appendix outlines the information gathered as part of the data-scoping exercise.

### **CARD database**

The CARD database records all responses to 111 calls and vehicle stops, whether or not they lead to arrests, and these events are coded/categorised in the database. The CARD database is the most comprehensive database the Police currently have. These data are also less affected by policing practice. CARD events include responses to 111 calls initiated by the public; whether or not events are included in CARD are not therefore dependent on factors related to policing practice, such as where Police patrol or the number of Police patrolling (as is the case in Police databases of arrests). CARD data are fully geo-coded; this enables the mapping of crimes to localities near licensed premises. The times of calls to the Police are also recorded. CARD data were used in an ALAC-funded programme looking at liquor outlet density in Manukau City (Cameron et al., 2010).

All offences and those that are alcohol related, such as disorder and assault, can be selected from these data. Data are available from 1 June 2005. Data are consistent over time.

All 111 and \*555 calls are answered by the three Police Communications Centres in Auckland, Wellington and Christchurch, although the Crime Recording Line Centre also answers these calls if the other centres are busy. All calls are handled in the same way, whether urgent or non-urgent; they are entered into the CARD database (Pers Comm Cameron Dewe, Statistics Officer, Police).

There are several instances where an event may not be entered into the CARD database. Phone calls to the watchhouses, if these are entered as CARD events or if the jobs are referred to communication centres or the Crime Reporting Line, will be in CARD. However, Police will often just respond to jobs directly, not entering them into the CARD database. This is most likely to occur in instances where no immediate attendance at the scene is required (Pers Comm Gavin Knight, National Statistics Manager, Police). People who front up directly to a watchhouse counter would not usually be recorded in the CARD database, unless their situations warranted Police units being dispatched (Pers Comm Cameron Dewe, Statistics Officer, Police).

Police National Headquarters permitted a scoping of the CARD data with a view to submitting a proposal (via its standard research application form) to secure access. Researchers working with the Queenstown Lakes District Council in the future would prepare research applications on

behalf of the council. The research application forms would be submitted to Police National Headquarters.

[http://www.police.govt.nz/resources/securedownloads/NZ\\_Police\\_research\\_application\\_requirements.pdf](http://www.police.govt.nz/resources/securedownloads/NZ_Police_research_application_requirements.pdf)

The effort to obtain these data is likely to be high (for the researchers involved in accessing the data and possibly the Queenstown Lakes District Council and other stakeholders involved).

#### *Recommendations:*

For Objective 2: Do not obtain.

For Objective 3: First determine if population estimates are accurate. If they are, we suggest that the Queenstown Lakes District Council work with researchers to initiate a request for CARD data from 2005 into the future. If accurate population estimates cannot be obtained, do not initiate request.

#### *Proposed future action:*

The Queenstown Lakes District Council (along with the researchers and other stakeholders involved) may like to consider building relationships with the Police with respect to access to CARD data (including for ongoing access to the data).

### **Offences by police station (Official Police Statistics)**

For each Police district, records are kept of the number of apprehensions and prosecutions for offences. Offences are recorded under seven offence categories e.g. 'violent offences', each of which is divided into a number of classes e.g. violent offences includes homicide, kidnapping and abduction, robbery, grievous assaults and so on, and each of these is divided into a number of offence types e.g. grievous assaults is divided into wounding with intent, injuring with intent, assault with weapon and so on. Alcohol-related offences can be obtained from these data, in particular disorder offences and assaults (grievous, serious and minor).

Offences by broad offence class have been recorded by the Police for some time. Offence categories can usually be obtained from 1994 onwards. There was a change to the Police offence database when a new computer system was implemented, which became operational from July 2005; at this point, the rate of offence recording increased by approximately 5% to 10%. This change in efficiency was largely as a result of having introduced more efficient technology, increasing the emphasis on staff training relating to offence records, and other associated system changes (Allan & Clarke, Axist Consulting, & SHORE, 2008). There is a way to, in part, control



for this change in an analysis if desired; however, we believe that it is more accurate to use the consistent data from 2005 onwards.

Data are available from 1 August 2005. As these data are required at the Police station level a specific request will need to be made via a standard research application form to Police National Headquarters. Researchers working with the Queenstown Lakes District Council in the future would prepare research applications on behalf of the council. The Police are usually willing to share these data (and these requests could be included in the same proposals as those for CARD data).

***Recommendations:***

For Objective 2: Do not obtain.

For Objective 3: First determine if accurate population estimates can be obtained. If they can, work with researchers to initiate a request for disorder offences and assaults (grievous, serious and minor) from August 2005 into the future (for Queenstown and Wanaka Police stations separately). If accurate population estimates cannot be obtained, do not initiate request.

***Proposed future action:***

None.

**Alco-Link (Police Intelligence Data)**

Since 2005 Police officers have recorded on charge sheets and traffic offence notices whether the apprehended offenders had been drinking, their estimated levels of intoxication (nil, slight, moderate, extreme) and where they had had their last drink. These data are available for Queenstown and Wanaka. (The Alco-Link data also record 'alcohol status not known'. At present this category is in the order of 30% nationally.)

Compared with other Police stations, Queenstown's offenders affected by alcohol are far more likely to have had their last drink in a bar than at home or in a public place, or at a special licensed event. Not all offenders are tourists; many are young New Zealand or foreign people living and working in Queenstown for several months or longer.

The data can pinpoint the types of crime and the types of drinking establishment associated with offending. They also include time of incident/apprehension. The following are incident numbers for a recent year (please note these differ from Official Police Statistics as Alco-Link is a separate database). These numbers are included here just to give a sense of the number of events/ alcohol-related offences in Queenstown. Disorderly offensive (272 people); drink driving (222

people); violence (163 people); dishonesty (54 people); drunk people (43 people). However, restricting the time period to 4.00am-7.00am (the timeframe of interest regarding the trading hours) reduces numbers substantially (around 45 events in the 4.00am-7.00am time spot in Queenstown).

A limitation with Alco-Link is that it is affected by Police practice. So the number of apprehensions/arrests is affected by the number of Police patrolling, where Police patrol and Police initiatives, for example in licensed premises. This makes it difficult to know if changes in the number of events over time are real changes or due to more Police operating, or that Police are targeting places where arrests may be more likely to occur, such as in and around licensed premises. As Queenstown is a tourist town and has a peak tourist season, it is likely that extra Police are utilised at this time. We are not aware of any instance when Police staffing and operation numbers have been made available to researchers to account for this fact in data analysis (and documenting Police staffing back in time could be difficult).

The Alco-Link data have been collected since 2005 in Queenstown. The Queenstown Police station seems particularly good at collecting this information. Charge sheets are very well filled in there, compared with other stations. They do not have a problem with time constraints in entering Alco-Link data at this station, which means that records are complete and the analyst is able to measure which officers aren't reporting, or are incorrectly reporting on, these data. They have recently switched to electronic charge sheet entry (referred to as the Custody Suite).

Problems with data include accurate location of last drink, and collecting full data on nationality, ethnicity, overseas address and place of birth. Licensees usually tell the Police that the reported 'location of last drink' is incorrect; however they have an incentive to say this.

Queenstown Police indicated they were happy to provide all the data needed with support and permission from Police National Headquarters. Support of the local Police has been gained. The Evaluation Manager at Police National Headquarters has been approached. Final approval for access is required via Police National Headquarters and their standard research application form.

***Recommendations:***

For Objective 2: Do not obtain.

For Objective 3: Do not obtain.

***Proposed future action:***

None.

## **Police Family Violence Incident Report - Poll FVIR (was POLL400)**

Specific data on family offences with alcohol involvement recorded.

While these data are available (electronic database back in time) they are not consistent over time. There have been major changes in the way these data have been recorded over time and Police training has increased the documentation of these cases. Serious offences are more likely to be reported to the Police, as are insurance cases.

If access were wanted, a research application to Police National Headquarters would be necessary. This would be completed by researchers working with the Queenstown Lakes District Council.

### *Recommendations:*

For Objective 2: Do not obtain.

For Objective 3: Do not obtain.

### *Proposed future action:*

None.

## **Transport crash data**

The NZ Transport Agency manages the Crash Analysis System (CAS), which records all crashes by level of severity and causative factors. There were 109 crashes causing two fatalities in the Queenstown Lakes District in 2009. Because of the high variability in crash data within a single year for a single region, it is preferable to look at data over a number of years. For example, 20% of the crashes in the Queenstown Lakes District between 2005 and 2009 were estimated to be alcohol related – this is below the New Zealand national average – but 41% of all ‘at fault’ drivers were under 24 years old. The most important factors associated with crashes in the Queenstown Lakes District were identified as ‘road factors’, ‘young drivers’ and ‘bends – loss of control or head on’ (New Zealand Transport Agency, 2010). There were only 12 alcohol-involved crashes in Queenstown in 2005.

The small number of traffic crashes related to alcohol in the Queenstown Lakes District means that any effect on crashes as a result of changes in trading hours would have to be very large before it became statistically significant. The concentration of drinking outlets and nearby accommodation (walking distance) in central Queenstown, along with tourists of whom some

may not hire/drive cars, may contribute to these lower numbers. Numbers are too small to utilise in a statistical analysis.

The database has Police-recorded injury data going back to 1980. Advances in Geographical Information System techniques have led to data being re-geocoded to road centrelines back to 2000. This change may not affect the comparability of data over time when we are looking at the whole region.

Land Transport New Zealand maintains the database and can arrange access over the internet.

*Recommendations:*

For Objective 2: Do not obtain.

For Objective 3: Do not obtain.

*Proposed future action:*

None.

**Lakes District Hospital ED**

Presentations at Lakes District Hospital ED, including time of attendance, reason for attendance and demographic information including age of patient. ED presentation data are available electronically. Presentations are ICD coded (International Statistical Classification of Diseases and Related Health Problems). The data are able to discriminate between presentations by New Zealand residents and tourists to the region if desired. As there is only one ED in the Queenstown Lakes District, data will represent the whole district. Data are available from 2005 onwards.

An indicator of alcohol involvement in ED presentations is not available electronically. Records of alcohol involvement in ED presentations can be obtained by searching hard copies of patient files (by paying a nurse to do so). However, at present we do not suggest doing this as alcohol involvement has been recorded in patients' files only on an ad hoc basis i.e. it has not been systematically coded. Therefore consistency over time may be compromised, particularly as there has been a recent focus on alcohol harm in the media that may have increased a clinician's likelihood of noting alcohol involvement in ED presentations.

We therefore recommend obtaining ED data for Friday and Saturday nights, from 2005 onwards, as a proxy for alcohol involvement (to avoid the issue of not being able to obtain a reliable indicator of alcohol involvement in ED presentations). Friday and Saturday nights are

likely to have the highest proportions of alcohol-affected patients relative to other nights. These data (without alcohol involvement) are useful as night-time attendance at EDs is linked to drinking. If alcohol involvement were systematically collected in the future, we would recommend using alcohol-related presentations specifically (here you would use alcohol-related presentations from all nights, not just Friday and Saturday nights).

There was a change in the ED data system, but we could not ascertain exactly when this was, however, it was likely to have been before 2005, as the same data in the Queenstown Lakes District were used to look at trends over time in a different study following 2005.

To access these data, permission from the Lakes District Hospital/Southern District Health Board manager is required and an ethics approval, via an application approved by a health and disability ethics committee, is needed (permission and ethics approval would be undertaken by researchers conducting the work, so there would be minimal effort for the Queenstown Lakes District Council).

#### *Recommendations:*

For Objective 2: Do not obtain.

For Objective 3: First determine whether population estimates are accurate. If they are, we recommend that the Queenstown Lakes District Council work with researchers to initiate an ethics application and ED data request from 2005 into the future. If accurate population estimates cannot be obtained, do not initiate request.

#### *Proposed future action:*

The Queenstown Lakes District Council may like to consider working with the Lakes District Hospital ED and Southern District Health Board to introduce the systematic collection of alcohol involvement in ED presentations on computerised triage forms in the Lakes District Hospital ED.

### **Hospitalisation data**

The National Minimum Dataset (NMDS) contains data on all inpatient stays in New Zealand hospitals, both public and private. These include data on patients who had initially arrived at EDs but whose condition was serious enough to require more than three hours' treatment (waiting time and triage are not included in the three hours). Patients who die whilst in the ED are also included in the NMDS. The National Non-Admitted Patient Collection (NNPAC)

collects data on outpatients and ED patients discharged before three hours. The NNPAC is a much more recent dataset with less information. It does not contain any ICD coding.

The NMDS records all inpatient episodes. Patients are given diagnosis codes drawn from the ICD-9 (until 2000) or the ICD-10. This can indicate the number of cases wholly attributable to alcohol (for example alcohol-related liver cirrhosis) or partially attributable to alcohol (for example cancer of the oesophagus). Changes in the incidence of these conditions can be observed over time. The advantage of using these data is that the methods for assigning an ICD-9 or ICD-10 code are well tried and consistent.

The disadvantage of using hospitalisation data for a small area such as the Queenstown Lakes District is that the number of cases that could be linked to alcohol is likely to be very small. The methods devised for measuring the burden of alcohol-related disease are intended for large populations. This may lead to trends or patterns in the data being obscured by random variation.

The data for the NMDS have been collected on a comparable basis since 1993. If hospitalisations for all conditions partially and wholly attributable to alcohol are required back until 1995, the ICD-9 codes will be used. Data are available at quite a low level, including broken down by the Census Area Unit in which the patient lives and by health facilities. The Census Area Unit is the second-smallest Census unit used by Statistics New Zealand; about the size of a suburb and with a median of 2,000 people.

The NNPAC is only reliable from 2007. Although ICD-10 external cause codes exist for alcohol involvement in an event (Y90 and Y91), these are rarely used in practice; in 2007/8, nationally, there were 160,000 injury events and Y90/Y91 codes were used in 367 of them.

The data are available from Analytical Services, National Collections and Reporting, Information Delivery and Operations, National Health Board, Ministry of Health.

*Recommendations:*

For Objective 2: Do not obtain.

For Objective 3: Do not obtain.

*Proposed future action:*

None.

## **Ambulance**

Data on call-outs for ambulance services include location, time and type of incident (including alcohol poisoning, assaults and falls) and actions of ambulance. A separate database is kept by St John in Queenstown that documents cases where alcohol was the primary cause of the incident (for this database two years of data are available, with time of incident and possibly location included).

The number of ambulance call-outs in 2005 for likely alcohol-related call-outs (assaults and alcohol/drug poisonings) was around 70 in Queenstown. Although total ambulance call-outs may be much higher than this, those likely to be alcohol related are relatively small in the Queenstown area (and smaller in Wanaka).

A limitation of all the ambulance data is that the St John call-out coding system changed on 1 October 2006. The researchers are uncertain about the impact of the Ambulance Services computer system changeover (data from 2006 onwards, however, are consistent).

Contact with St John is required to gain access to these data (details appended).

### *Recommendations:*

For Objective 2: Do not obtain.

For Objective 3: Do not obtain.

### *Proposed future action:*

None.

## **Noise control complaints**

Data on noise control complaints within the central business district that are related to licensed premises. The number of events is very small so cannot be used reliably in statistical analysis. Electronic records are available from 2008 from the Queenstown Lakes District Council.

### *Recommendations:*

For Objective 2: Do not obtain.

For Objective 3: Do not obtain.

### *Proposed future action:*

None.

## Accurate population data for Queenstown, 2005 onwards

Population data are necessary to act as the denominator when measuring rates and to help make sense of the data. This item is a measure of the ‘at-risk’ population, which is the denominator in all measures of harm. This is especially important for this region, where the resident population is swollen by both tourists and seasonal workers (it means that Census data, which usually suffices in other geographical areas, does not in the Queenstown and Wanaka areas). For example, if more people were being apprehended after 4am following the liberalisation of licensing hours, this could be because of:

- a) longer licensing hours; or
- b) more people being in the area due to, for example, the Winter Festival.

Residents: Census data documenting the usually resident Queenstown population will be consistent and available. In the 2006 Census, the resident population was 22,959.

Seasonal workers: It is possible that many of those who work in Queenstown are there on a seasonal basis. That is, they are there for a short time period to work in the summer or winter tourist business. Those who have been brought in to the area to work on construction projects are short term but may be in the area for longer than a year. A high number of seasonal workers may be linked to harmful drinking as they are usually younger and away from family. Numbers supplied by the Policy and Planning department of the Queenstown Lakes District Council for the Queenstown area for 2007 are:

**Table 1: Workers in Queenstown Lakes District**

	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
Number of full-time staff	2388	2308	2366	2393
Number of part-time permanent staff	452	375	415	420
Number of seasonal/casual staff	647	424	1985	1222
Total	3487	3107	4766	4035

The seasonal workforce peaks in the winter season when it reaches 42% of the total workforce. Most of these workers are in sectors directly related to tourism. In the construction sector only 16% of workers are considered seasonal. This may just be a result of the types of construction project underway at that time. There is no mention of seasonal workers in the Queenstown Lakes District Council community plan.



Tourists: Visitors are classed into day visitors and overnight visitors. Overnight visitors are further classed into those who stay in commercial accommodation (hotels, lodges, campsites) and those who stay in private accommodation such as holiday homes. On an average day there are 13,000 visitors to the district, of whom 60% stay in commercial accommodation and 30% in private accommodation, and 10% are day visitors. However, during the peak of the season this shifts around considerably, with 55,000 visitors, of whom 57% are in private and 34% commercial accommodation. Guest nights in commercial accommodation are measured by Statistics New Zealand's Commercial Accommodation Monitor. This contains monthly data back to January 2000 for Queenstown and Wanaka separately. Data can be obtained back to 1996 on a different basis, with the breakdown being between the Queenstown Lakes District and Central Otago.

Data on the percentage of visitors staying in private residences as opposed to commercial accommodation are based on the 2004/5 Peak Population Survey. Total visitor nights for the Queenstown regional tourism organisation and Lake Wanaka regional tourism organisation are available from the Tourism Strategy Group, which sources data from both domestic and international travel surveys. These data are on a consistent basis back to 2004.

Both Census data and the Commercial Accommodation Monitor are available. The Queenstown Lakes District Council Policy and Planning department may have more detailed information on seasonal workers and visitors in non-commercial accommodation, as this underlies the planning projections made to inform council strategy (Queenstown Lakes District Council; Rationale Limited, 2011). The Tourism Strategy Group has information on both international and domestic visitors drawn from travel surveys. This is on an annual basis.

Census data can be obtained from Statistics New Zealand. The Commercial Accommodation Monitor is available online from the Tourism Strategy Group, which also provides data on overall visitor numbers. Most of the data in this section are publicly available online.

Data from Censuses, the Commercial Accommodation Monitor, the Tourism Strategy Group and other sources can be amalgamated to give estimates of the number of visitors, the purpose of their visits and their demographic characteristics. The Queenstown Lakes District Council is in the process of preparing a housing market assessment that will provide a clear picture of property usage in the area.

*Recommendation:*

As the population estimate will be the denominator in all measures of harm/offending, and therefore very important, we recommend that the Queenstown Lakes District Council consider determining the accuracy, consistency over time and coverage of the available population data.

*Proposed future action:*

We recommend that the Queenstown Lakes District Council consider undertaking a piece of work (with researchers) to assess the quality and coverage of population estimates for Queenstown and Wanaka. This would require obtaining the different data sources outlined, combining them, and undertaking in-depth discussions with the agencies that collect the data to ascertain their accuracy and limitations and to determine if they are consistent over time. Assessments of whether any groups of tourists are missing from the data will also be needed.

**Documenting trading-hours changes**

When assessing trading-hours changes it is ideal to know how many premises, and which ones, had their hours changed in order to contextualise findings. This information has already been extracted for Queenstown with respect to the 2007 4.00am trading-hours change. These data were extracted from Lakes Environmental, which has records of all liquor licences in this area and all variations, such as changes to trading hours. These data were sampled and Lakes Environmental's records appear consistent over time and are the most complete records available.

In the future, if further trading-hours changes occur and the collection or analysis of data is to take place, it would be useful to have these data again. However, it would not necessarily prevent analysis from going ahead if these data were not available.

The effort required from the Queenstown Lakes District Council to obtain these data in the future is moderate to high, as records are in hard copy and will need to be pulled and collated by its own staff. Alternatively this information could be set up and maintained as an electronic database, but this may require more effort than pulling the information as and when needed. Perhaps the best focus, however, is to continue to ensure that the hard copy records remain as accurate as they are now (so they are there if needed).

The LLA also has records of liquor licences in the Queenstown Lakes District from 1990 to 2010, with permitted trading hours attached. However, we believe that currently these records do not provide the necessary information (as the Lakes Environmental records do). If a renewal or

variation occurs, such as a trading-hours change, in the LLA records the new information is updated in the same record. This means that it is not possible to tell exactly how many, and which, premises change their trading hours when changes occur (as the previous hours may have been overwritten).

*Recommendation:*

Continue to ensure that the hard copy records of Lakes Environmental remain as accurate as they are now. Collate this information from Lakes Environmental records as and when needed.

*Proposed future action:*

It could be possible in the future for the Queenstown Lakes District Council and ALAC to explore with the LLA the issue with its data to see if the LLA might make some data/system changes. Or the Queenstown Lakes District Council could request snapshots of the LLA data quarterly or so.

**Actual trading hours of liquor outlets**

The legal hours of operation of liquor outlets do not necessarily match the actual hours of trading. This means that premises may close earlier than the time to which they are licensed, meaning that the availability of alcohol to the population may be less than what is thought (useful to know when trying to assess how much change has taken place if trading hours change).

After consulting Lee Webster (Manager, Regulatory and Corporate, Lakes Environmental), the decision was made that, due to premises varying their closing times to suit, obtaining accurate actual trading hours was not feasible.

## **Appendix Two: Analysis of statistical power**

The Queenstown Lakes District Council wishes to know if the amount of data available is sufficient to measure any changes in alcohol harm as a result of the change in maximum trading hours in Queenstown and Wanaka. In the report we discussed a number of measures of alcohol harm that could be useful. These include: data on admissions to the Lakes District Hospital ED, Alco-Link data allowing reported offences to be linked back to drinking venues, and Official Police Statistics offence data.

In the case of the first and third, these are ‘proxy’ indicators where the link to alcohol is not absolute. Not all ED admissions and Police offences are alcohol related, although by focusing on ED admissions on Friday and Saturday nights and offences such as ‘disorder’ and ‘minor assaults’, we might strengthen the indicators’ links with alcohol.

Statistically there are a number of considerations. To assess whether an indicator has changed as a result of a change in the environment, we need to know how the indicator varies over time randomly – how ‘noisy’ it is. It is more difficult to observe a systematic change in a noisy dataset than in one with low levels of noise. Typically, monthly observations are noisier than annual ones.

There is also the necessity to control for confounding variables. The data referred to above have been collected for routine or administrative reasons. Police offence data have changed as a result of changes in the Police computer recording system or could have been changed by changes in the number of Police on the streets or how offences are treated (this is particularly the case for the minor offences considered here). ED admissions could vary as a result of changes in the provision of other medical services in the area. In addition, ED admissions in Queenstown show a highly seasonal pattern – controlling for confounders uses up the degrees of freedom in the dataset and makes the results more difficult to interpret.

There are two types of error in testing hypotheses statistically. The first is type 1 error, or wrongly rejecting the null hypothesis. In this case this would be concluding that the change in alcohol availability had reduced alcohol harm when, in fact, it hadn’t. The second, type 2 error, is wrongly accepting the null hypothesis. In this case this would be concluding that the change in availability had had no impact on alcohol harm when in fact it had. Scientific experiments are designed to minimise the possibility of both types of error using power analysis. We present some results below, but they are indicative only as this is not experimental data.

Finally there is the issue of effect size – for example, if the statistical results showed a significant fall of one in the number of disorder offences in the course of a year. This may be politically insignificant/practically insignificant.

## **Data**

### *Lakes District Hospital ED admissions*

There were around 600 admissions to the Lakes District Hospital ED on Friday and Saturday nights in 2006. We also have some data on monthly admissions to the ED in 2005/06 from the Multi Agency Liquor Enforcement Study (MALES). If we assume that 600 is the mean and there is a standard deviation of 25, then 20 observations (data points) before the change and 20 observations (data points) after will be sufficient to ensure that a difference of 18 in annual ED admissions is detectable. This is a type 1 error. If we assume an effect of 40, i.e. that the change in trading hours reduced admissions to 560 a year, we require eight observations (data points) before and eight data points after the change. This calculation is based on assumptions as we only have one annual observation and don't know if that was a high, low or average year.

### *Official Police Statistics – offence data*

We have yearly offence numbers (see Table 4) for Queenstown and Wanaka for 2006 and MALES data for Queenstown on a monthly basis for 2002-2006 (there was some discrepancy between the two data sources).

The average number of monthly disorder offences in Queenstown between 2002 and 2006 was 12.2, with a standard deviation of 7.5. This series is difficult to analyse because of the noise. For example, if disorder offences were to fall to zero, this would still be within the random variation and hence could not be attributed to a change in the environment. The small numbers and the fact that recorded offences cannot go below zero make the use of monthly data problematic.

**Table 1: Number of annual disorder events in Queenstown and Wanaka**

	Queenstown	Wanaka
Disorder	413	74

For annual estimates we assumed: mean=413; assumed mean after change=370. Assuming the same standard deviation as for the ED data, seven data points are required before the change and seven data points after the change. Even if we assume the standard deviation to be smaller (10 or 15), we still do not have enough data points. Also we would tend to think that the standard deviation was nearer the higher end.