The Allen Consulting Group

Alcohol-related harm and the operation of licensed premises

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Report to the Department of Justice

The Allen Consulting Group

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Contents

Executive summary

Introduction

The Allen Consulting Group has been commissioned by the Department of Justice to estimate the social costs of alcohol-related harm in Victoria and to review the available evidence linking alcohol-related harm to the operation of licensed premises. This is because the Victorian Government has committed to a review of liquor licensing fees that involves 'consideration given to a differentiated, risk-based fee structure that also operates as a mechanism to ensure that licensees associated with the most harm pay a commensurate fee' (Victorian Government 2008, p. 32).

Consideration of a risk-based fee structure requires a detailed and robust understanding of a number of important factors that are covered in this report, namely:

- the costs of alcohol related harm in Victoria and the quantum of costs borne by the Victorian Government;
- a review of evidence from the literature examining the link between alcohol-related harm and licensed venues, and whether there are any factors associated with licensed premises that indicate higher risk of alcohol-related harm;
- data analysis which tests whether any factors identified in the literature review are associated with alcohol-related harm in or near licensed venues in a Victorian setting; and
- the development of risk-based licensing models to encourage licensees to modify their behavior to reduce the social costs of alcohol-related harm.

Key findings of the report are outlined below.

The social cost of alcohol-related harm in Victoria

Chapter 2 estimates the social costs of alcohol-related harm in Victoria, and more specifically the quantum of costs borne by the Victorian Government. In the absence of other readily available data, a national study completed by Collins and Lapsley (2008) measuring a range of tangible and intangible costs of alcohol-related harm was used to derive the Victorian estimates for this report. Analysis of this work suggests that in 2007-08, the social costs of alcohol-related harm in Victoria approximated $4 billion. Of this, $366 million or approximately 9 per cent of the total was borne by the Victorian Government.

When comparing the difference between social and government costs of alcohol-related harm in Victoria, the results suggest that almost 70 per cent are borne by the non-government sector, as follows:

- intangible costs which include costs associated with pain and suffering associated with disability, loss of well being and premature death account for $1164.8 million or approximately 27 per cent of the total;
- indirect costs due to production losses in the workforce and at home (totalling $1143.6 million) account for approximately 27 per cent of the total;

- the majority of road accident costs ($549 million out of $571 million) are also borne by the non-government sector (in Victoria these are covered by the Transport Accident Commission) — these account for 14 per cent of the total; and
- crime costs associated with property damage and insurance administration (totally $66.6 million) account for approximately 2 per cent of the total.

These four areas of non-government costs explain why government costs are significantly lower than the total social costs of alcohol-related harm. A further 10 per cent is attributed to the costs associated with abusive resource consumption — an opportunity cost measure of alcohol consumption — totalling over $438 million in 2007-08.

The focus of this report is on the costs faced by the Victorian Government. It is noted that just over half of government costs (53 per cent) are accounted for by policing and 18.4 per cent attributed to health care. Of these health care costs, 81 per cent accrue to the hospital sector, indicating the seriousness of associated harm from excessive alcohol consumption.

The timeframe for this analysis has precluded the estimation of actual costs for alcohol-related harm in Victoria and has instead relied on a derived measure of cost based on the work of Collins and Lapsely (2008). In the longer term, the estimation of government costs associated with alcohol-related harm would be more accurately measured using a methodology that relies on actual estimates of government outlays.

Results of the literature review

Chapter 3 reviews the literature to establish the link between alcohol-related harm and licensed venues. The evidence reviewed suggests the nature and extent of alcohol-related harms varies between licensed premises. Empirical research shows that certain identifiable characteristics and practices of licensed premises are associated with alcohol-related harm. These factors can be classified as relating to physical, social and regulatory environments. Licensed premises can control and influence some of these factors, while other factors are external.

The literature tends to focus on internal factors as determinants of alcohol-related harm. These factors are highly relevant to licensees and policymakers, as they can be directly influenced or controlled, and are therefore usefully considered in relation to the design of a risk-based licensing framework.

While there is no agreed hierarchy of risk factors in the literature, five risk factors are found to be significant in terms of criteria of empirical evidence and feasibility as a basis for risk-based licensing, namely operating hours, patron intoxication, crowding, staff and management practices, and venue type.

However, while there is available evidence from the literature which suggests these risk factors are important in explaining alcohol-related harm, the literature does not examine the comparative strength of these relative factors — nor provide definitive answers about which policies are most appropriate to mitigate such risk factors. The data review takes this analysis further by empirically testing these relationships in a Victorian setting as well as assessing the relative causal contribution of the risk factors.

Results of the data review

Chapter 4 presents the results of the data analysis which tests whether the risk factors identified by the literature review are similarly associated with alcohol-related harm in Victoria. The analysis is based on a data set provided by the Department of Justice containing information on a large sample of licensed premises in Victoria. The data set contains venue-specific information on each licensee matched with data on liquor infringement notices and offences in or near these premises recorded by Victoria Police. The types of offences captured by the data are assault, robbery against a person and property damage. Data on the number of these offences in or near licensed premises over the period 2006-08 was used as a proxy for alcohol-related harm.

This analysis was achieved through basic statistical analysis of the available data to indicate high-level trends and findings, as well as more in-depth analysis using regression modelling. The basic statistical analysis represents a straightforward comparison of the proportion of licensed premises, for different risk groups, that were associated with offences in or near licensed premises. Regression analysis is a more robust form of analysis and was necessary for drawing firm conclusions regarding the data.

The analysis includes an assessment of risk factors for opening hours, patron intoxication and venue type. However, it does not include risk factors for crowding and staffing and management practices, as the data set did not contain any information regarding these risk factors.

The modelling suggests that three licensed venue risk factors — *venue type (gaming), late opening hours* and *venue infringements for intoxication* — are all positively correlated with offences in or near licensed premises. Specifically, the results indicate licensees with the following characteristics are associated with higher rates of offences:

- licensees that have received one or more infringements for patron intoxication;
- licensees offering gaming facilities (where the evidence is stronger for hotel gaming relative to club gaming); and
- licensees open after 1am on Wednesday-Friday and/or Saturday nights.

In relation to the results for licensees offering gaming facilities, it is not possible to determine exactly what is driving the higher rates of offences at such venues. This may be due to some other factor that is common to gaming venues (aside from late opening hours, venue capacity or infringements for intoxication), rather than the existence of gaming facilities. Whist the causality of a link between gaming facilities and higher rates of offences is not established, the analysis provides very strong results to suggest that licensees offering gaming facilities are likely to be associated with higher rates of offences relative to those that don't offer gaming facilities.

The results of the analysis also imply different levels of relative risk between different types, levels and combinations of risk factors. Risk relativities were calculated mostly by using the regression results to predict the rate of offences in or near licensed premises with different types, levels and combinations of risk factors. In the instance that the risk types or levels could not be captured by the regression analysis (only for the low-medium risk group), relativities were based on the results of the basic data analysis. The outcomes of this analysis are summarised in Table ES.1.

Table ES.1

SUMMARY OF RISK RELATIVITES

Risk relativities
Low risk
Licensed premises with none of the specified risk factors
Low-medium risk
Licensed premises with club gaming facilities
Licensed premises that close between 11:01pm and 1:00am
Medium risk
Licensed premises that close between 1:01 and 3:00am
Licensed premises with one to two infringements
Licensed premises with hotel gaming facilities
High risk
Licensed premises that close after 3am (not including premises with hotel gaming)
Licensed premise with three or more infringements
Very high risk
Licensed premises that close after 1am and that also have one or more infringements

Source: Allen Consulting Group analysis.

The above discussion outlines the key results of relevance to the design of a risk based licensing model. In particular, it provides evidence to suggest that licensees exhibiting the risk factors for patron intoxication, venue type (gaming only) and opening hours are likely to be associated with higher rates of offences relative to other licensees. In addition, it provides an evidence base to inform decisions regarding how to weight different types, levels and combinations of risk factors

Strengths and limitations of the regression analysis

While the results of the regression analysis provide a relatively sound basis for the design of a risk-based licensing system, there are however some cautionary limitations:

- the analysis was based only on general and on-premise licensees (which amount to around 44 per cent of licensees in the data set);
- the analysis was not able to include all risk factors such as 'overcrowding' and 'management practices' due to lack of data;

- data for some of the variables were missing (e.g. the venue type is unknown for 70 per cent of general and on-premise licensees); and
- data on offences may not represent the true level due to under-reporting and/or under-recording.

In relation to the missing data for venue type, the implication is that some high risk venue types (i.e. those not explicitly captured by the venue type variable, such as nightclubs or pubs) may not have been identified as being high risk through the analysis. In particular, the findings for 'live and recorded entertainment' venues should be interpreted with caution. The findings regarding hotel gaming are regarded as reasonably robust given that most hotel gaming venues are identified in the data (and therefore captured by the gaming category under the venue type variable) and the findings are supported by the results of the basic data analysis which finds that 70 per cent of licensed premises with hotel gaming were associated with one or more offences.

Despite these limitations, the results of the data analysis do provide strong evidence as to the existence and magnitude of a correlation between each of the risk factors (patron intoxication, opening hours and gaming) and offences in or near licensed premises.

Risk-based models

This report has considered a number of risk-based models for designing and applying licensee fees, see Table ES.2 for an overview. The ultimate objective is to encourage licensees to modify their behaviour.

Table ES.2

RISK-BASED MODELS

Area	Options considered
Applying the risk factors	• Set fee for each risk factor • Broad differentiation of fees • Highly differentiated fees
Assessment	• Self assessment • Independent assessment
Time period	• Prospective • Retrospective
Framing	• Lower fee for those with a lower risk profile • Higher fee for those with a higher risk profile
Accounting for large fees or variations	• Cap on fee increases • Different payment options (monthly, quarterly, annually)

The risk factors for opening hours and patron intoxication identified in the data analysis are consistent with those found in other jurisdictions. For example, liquor licensing in Queensland and Ontario recognise the increased risk associated with venue type, opening hours and compliance history. Greater Geelong's late licensees land rate differential has venue opening hours as its sole risk factor. In relation to gaming, there does not appear to be a precedent where a jurisdiction has focussed on gaming as a risk factor. However, given that the data analysis suggests strong evidence of a relationship between gaming and offences in or near licensed premises, gaming is regarded as a risk factor that should be included in a risk based licensing model.

Given the lack of data available to test the significance of the risk factors for crowding and staffing and management practices, these are not included in the risk based licensing models outlined in this report. This does not suggest, however, that these two risk factors should not be considered as part of a risk based licensing model in Victoria.

Applying the risk factors

The results of the data review imply different levels of relative risk between different types, levels and combinations of risk factors — as summarised in Table ES.1. These relativities could be used to determine different fee levels under a risk based licensing system. Alternatively, relativities based on more detailed differences between licensed premises (i.e. licensed premises that close at 1am versus those that close at 2am versus those that close at 3am and so on) could be used.

This report proposes two models for differentiating fees within the risk factors identified in this report. These are relevant to the risk factors for patron intoxication and opening hours. Given data limitations, the analysis did not explore differentiation within the risk factor for venue type (gaming).

Model 1 represents broad differentiation within the two risk factors, where the fee for licensees with one to two infringements, or that close between 1:01 and 3:00am, is half the amount of the fee charged to licensees with three or more infringements, or that close after 3:00am. An option for Model 1 could also include a category for licensees that close between 11:01pm and 1:00am. Model 2 represents a high level of differentiation, where the amount of the fee differs according to discrete changes in the number of infringements and closing time.

The two models differ in the extent to which they reflect the data analysis, the approach in the comparator jurisdiction (Queensland) and complexity. On these measures, Model 1 (broad differentiation) is regarded as the preferred approach as it better reflects the available data and is simpler to implement. It also reflects the approach adopted in Queensland.

In relation to venue capacity, the literature review found that larger venues are more likely to be associated with harm due to the fact that there are more patrons present at such venues. Although this finding could not be adequately tested due to limitations with the data, venue capacity is still regarded as important and should be taken into account in determining the appropriate fee.

Model design considerations

This report has also considered more detailed aspects of the model's design. If fraud is not anticipated to be a major issue, then self assessment of risk would be adequate (backed up with penalties for providing misleading information). Setting fees will most likely need to take account of both prospective and retrospective elements, depending on the risk factors used in the model. The literature suggests that fees should be framed or presented as additional costs due to higher risk. Finally, different payment options could be considered if fees are likely to be significant, and/or vary significantly.

Conclusion

Based on a review of the literature, and detailed analysis of the best available data for Victoria, this report concludes that certain characteristics and practices of licensees are associated with a higher risk of alcohol related harm, and can be included in a risk based fee model.

Moving forward, there are a number of areas where better data in future would be useful in refining the model itself (for example, information on other types of venues — currently unknown — would give a better feel for the precise extent to which gaming represents an elevated risk relative to other venue types), and conclusively determining whether other risk factors should be included (such as live and recorded entertainment).

Chapter 1

Context

1.1 Background

Alcohol plays a role in most Victorian's lives and is widely supported in our society as a legitimate way of socialising, celebrating and relaxing. In Victoria, there are positive aspects to the role alcohol plays in our culture, including in its renowned vineyards and laneway culture, as well as its contribution to social life and the economy. Liquor licensing reforms over the past twenty-five years have supported development in these aspects of Victorian culture by allowing more convenience and competition in the service of alcohol (Victorian Government 2008).

However, recent Australian studies demonstrate that the costs of alcohol-related harm — to individuals, communities and government — are significant (see Collins & Lapsley 2008). To address this, the Victorian Government released Victoria's Alcohol Action Plan 2008–2013 — *Restoring the Balance*, which aims to prevent and reduce the harm associated with alcohol misuse in Victoria.

As part of this plan, the Victorian Government committed to a review of liquor licensing fees that would consider 'a differentiated, risk-based fee structure that also operates as a mechanism to ensure that licensees associated with the most harm pay a commensurate fee' (Victorian Government 2008, p. 32). Similar considerations have led other jurisdictions — notably Queensland and Ontario — to implement risk-based liquor licensing models.

To consider a risk-based licensing model, the Victorian Government would need a detailed and robust understanding of:

- the costs of alcohol-related harm in Victoria and the quantum of costs borne by the Victorian Government; and
- the association between alcohol-related harm and licensed venues, including if venues with certain characteristics or operating procedures have an increased risk of contributing to alcohol-related harm.

This project aims to inform the Victorian Government's understanding of these issues. Specifically, this project:

- examines the evidence base for considering models for a risk-based licensing system in Victoria;
- identifies data limitations and future research areas to assist in the development of risk-based licensing structures; and
- identifies and assesses models for attributing costs to licensed premises through a risk-based licensing structure.

1.2 Alcohol-related harm in Victoria

Alcohol is associated with a range of harms, which together impose a significant cost on Victoria.

In *Restoring the Balance,* the Victorian Government identifies the extent of some of these alcohol-related harms in Victoria each year, as shown in Box 1.1.

Box 1.1

ALCOHOL-RELATED HARM IN VICTORIA EACH YEAR

- 24,714 inpatient hospitalisations
- Over 8,000 emergency department presentations
- Over 4,700 ambulance attendances in metropolitan Melbourne
- 64 per cent of 18–24 year olds and 32 per cent of 14–17 year olds binge drinking
- 759 alcohol-related deaths, 57 road deaths
- 13,000 seeking treatment for alcohol problems
- 487 infringements to licensees breaching liquor laws
- 2,472 infringements to minors for possession of alcohol
- Approximately 2,000 assaults involving young people affected by alcohol
- 16,500 drivers convicted of drink and/or drug offences
- 10,000–15,000 people apprehended for public drunkenness
- Over 1,500 assaults in licensed premises
- 37 per cent of parents with children entering foster care with alcohol abuse problems

Source: Victorian Government 2008.

As Chapter 2 discusses, the total social costs of alcohol-related harm in Victoria in 2007-08 is estimated to be around $4.3 billion. Of this amount, estimates suggest approximately $366 million is borne by the Victorian Government.

1.3 Liquor licensing in Victoria

Over the past two decades the number of liquor licences has increased in Victoria. However, the rate of increase has declined from 11 per cent in 2002–03 to 2.7 per cent in 2007–08 (CAV 2008). The largest increases are for on-premises licences, limited licences, pre-retail licences and packaged liquor licences (Victorian Government 2008).

The types of businesses that may hold a liquor licence are listed in Table 1.1 with the type of permit, licence and renewal fee. Already there are some differentials between licence type and renewal fees, although most locations pay the same initial licence fee. In addition to standard licence and renewal fees, licensees that are open after 11pm to 1am on any night are required to pay an additional fee which increases for the hours between 1am to 7am.

To minimise the potential for misuse or abuse of alcohol (including anti-social behaviour) special risk-based conditions may be imposed on licences. Additional conditions include requiring: surveillance recording systems; Responsible Service of Alcohol (RSA) trained staff; crowd controllers; and maximum patron numbers. 'High-risk' operating practices that can attract conditions include: licensed venues that trade past 1am and provide live bands or DJ's using amplified music; venues providing sexually explicit entertainment and major dance/entertainment events (i.e. dance parties) (KPMG 2008).

Table 1.1

LIQUOR LICENCE FEES AND PERMITS BY ACTIVITY TYPE

Type	Category or licence permit	Licence fee ($)	Renewal fee ($)
Restaurants, bars and cafes	On-premises licence	584.50	323.90
Retail liquor stores and supermarkets	Packaged liquor licence	584.50	249.90
Pubs, hotels and taverns	General licence	584.50	323.90
Clubs	Full club licence	584.50	261.80
	Renewable limited club licence	584.50	98.70
One off events such as a ball or presentation night	Temporary limited licence	58.50	
Bed and breakfasts, caravan parks, small wineries, internet vendors and other businesses	Renewable limited licence	58.50	93.00
Wholesalers, producers, brewers and liquor importers	Pre-retail licence	584.50	226.00
Large winemakers	Vigneron's licence	584.50	226.00
Restaurants and clubs without a liquor licence	BYO permit	128.60	154.00
Additional hour charges			
• Monday to Saturday 11pm to 1am the following day annual fee of $633.20, 1am to 7am annual fee of $1666.20 • Sunday 1am to 7am annual fee of $1666.20, 7am to 10am annual fee of $553.30 • Sunday, Good Friday and ANZAC Day 11pm to 1am the following day annual fee of $998.60 • Good Friday and ANZAC Day 7am to 12noon annual fee of $817.20			

Source: Consumer Affairs Victoria 2009.

1.4 Project approach

The first research stream estimates the costs of alcohol-related harm in Victoria. This involves firstly identifying and estimating the economic and social costs of alcohol-related harm in Victoria. From these costs, the tangible costs that the Victorian Government bears from alcohol-related harm can then be quantified.

As noted previously, this project will inform the Victorian Government's consideration of risk-based fee models, whereby those licensees associated with greater harm pay higher fees. Establishing the link between licensed venues and alcohol-related harm is therefore a crucial step towards identifying those characteristics or practices of licensed premises that are associated with higher rates of harm.

The second research stream examines these relationships, drawing on both secondary analysis of the research literature, and primary analysis of Victorian data of licensed premises and alcohol-related harm. A literature review completed in Chapter 3 examines the link between alcohol-related harm and licensed venues, while Chapter 4 examines the empirical evidence for such links.

The third research stream examines the relationship between licensed venues and alcohol-related harm with reference to arrangements in other jurisdictions — notably Queensland and Ontario — which have identified risk factors for alcohol-related harm as part of risk-based licensing frameworks. This discussion examines the options for aspects of designing a risk-based model in Victoria.

Additionally, limitations of the data are discussed in Chapter 4 and Appendix C.

1.5 Report structure

The structure of this report is outlined in Table 1.2.

Table 1.2

REPORT STRUCTURE

Chapter
Chapter 2 Estimates the cost of alcohol-related harm in Victoria and the quantum of costs borne by the Victorian Government
Chapter 3 Assess the available literature on the association between alcohol-related harm and licensed venues, including if venues with certain characteristics or operating procedures have an increased risk of contributing to alcohol-related harm
Chapter 4 Presents a statistical analysis of Victorian data of licensed premises and incidents of harm to test the relationships between risk factors and incidents of alcohol-related harm
Chapter 5 Assesses models of attributing costs arising from alcohol-related harm to licensed premises through a risk-based licensing fee structure
Chapter 6 Outlines the key conclusions and next steps

Chapter 2

The costs of alcohol-related harm in Victoria

This chapter estimates the social costs of alcohol-related harm in Victoria, and more specifically, the quantum of such costs borne by the Victorian Government. In the absence of alternative data, the work of Collins and Lapsley (2008) is relied upon to derive these estimates. Analysis suggests that in 2007-08, total social costs of alcohol-related harm in Victoria approximated $4.3 billion of which $366 million was borne by the Victorian Government. This chapter concludes with a brief discussion about the robustness of such analysis and how it may be improved for the future.

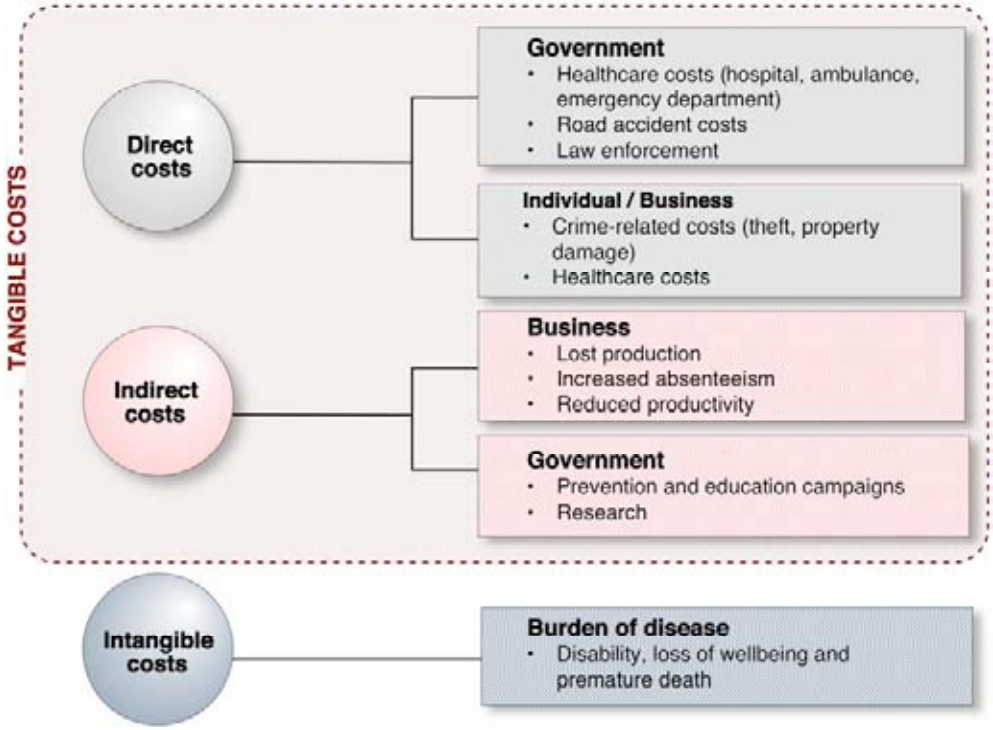
2.1 Framework for cost analysis

Total economic costs measure both private costs and social costs. Private costs are those costs that an individual willingly bears (for example, the purchase of alcohol). In comparison, social costs are those costs that accrue to the rest of society through the result of negative externalities (for example, disruptive behaviour caused by alcohol-related activities). It is proposed that this project focuses on social costs given the accrual of private costs to individuals are not relevant to the formulation of public policy.

The proposed framework to capture relevant costs is outlined in Figure 2.1. It is based on a methodology that measures a range of direct, indirect and intangible costs associated with alcohol-related harm. This framework will allow for estimates to be identified that measure the amount that could be potentially saved or gained — should alcohol-related harm be eradicated.

Figure 2.1

PROPOSED FRAMEWORK: COST ANALYSIS



Source: Allen Consulting Group.

This framework allows for the costs relevant to the study to be classified according to tangible and intangible costs as follows (Single et al. 2001).

- **Tangible costs**: can be defined as those costs that when reduced, yield resources that can then be used by society for consumption and investment purposes. Such costs can be classified further into direct costs and indirect costs.
  - **Direct costs**: which measure those costs that are directly caused by alcohol-related harm, noting such costs are borne by government and/or non-government sources (e.g. individuals and businesses). Direct government costs include law enforcement costs associated with policing and associated justice system costs, and also include those costs associated with health care caused by injury and violence stemming from alcohol-related harm. Similarly, business and individuals can face direct costs due to the impact of criminal activity on property, as well as out-of-pocket payments for health care stemming from injuries caused by third parties.
  - **Indirect costs**: which measure those costs that stem from the impacts or consequences of alcohol-related harm, noting that such costs can again be attributed to governments and non-government sources. For instance, indirect costs faced by government can include prevention and education campaigns to stem the incidence of alcohol-related harm, while indirect costs from a business or individual perspective, include those costs relating to lost productivity due to illness and premature death.

- **Intangible costs**: these include costs which measure pain and suffering associated with disability, loss of well being and premature death, and when reduced, do not free up resources for alternative uses. Such costs are typically difficult to measure and are often excluded from cost analyses.

The types of costs represented in Figure 2.1 are by no means a comprehensive list of the full direct and indirect costs associated with alcohol-related harm. Other costs may include: costs associated with domestic violence and child abuse and neglect; household (unpaid) labour costs (from premature death and sickness); resources used in abusive consumption of alcohol. Not all such costs will be able to be quantified for this review, due to both the lack of available data and the timeframe for this project.

2.2 Methodological approach

Direct estimation of the social costs of alcohol-related harm is a significant and methodologically complex task, and one that could easily absorb the entire timeline and budget available for the project. Data limitations are also likely to undermine attempts to identify Victorian costs with any degree of precision.

As a consequence, this study relies on the existing evidence-base of published estimates to derive a "top-down" estimate of Victorian costs. While this is appropriate given the objective and timeframe of this study, it is nevertheless acknowledged, that a more accurate estimate of the costs of alcohol-related harm borne by the Victorian Government could be derived from a "bottom-up" approach using Victorian estimates of actual expenditure on alcohol-related harm. In this context, this study relies on the existing evidence-base of published estimations, rather than conducting new modelling, with this section detailing the methodological approach.

The sources of data for cost-estimates and method for estimating Victorian costs are outlined in Appendix B of this report — with the results of this analysis detailed below.

2.3 Victorian estimates of alcohol-related costs

Victorian estimates

The total social cost of alcohol-related harm in Victoria in 2007-08 is estimated at $4295.6 million. The derivation of this estimate from the original Collins and Laspey (2008) study is outlined in Table 2.1.

Table 2.1

RESULTS OF ANALYSIS: VICTORIAN TOTAL COSTS DERIVED FROM COLLINS AND LAPSELY (2008)

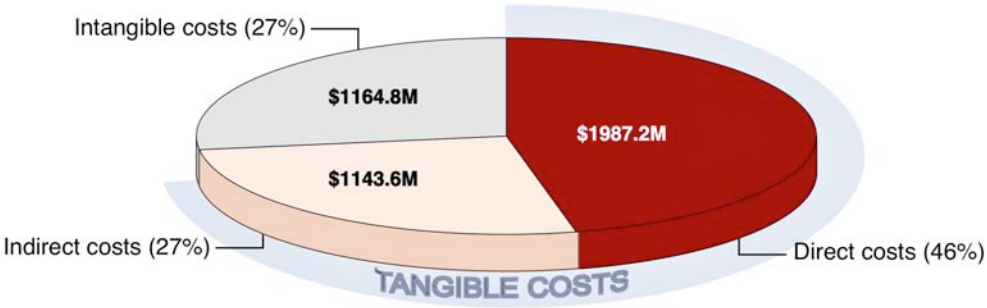
	Collins and Lapsley national estimates ($m)	Population adjustment	Updating for 2007/08	Victorian cost estimates ($m)
Direct costs				
Healthcare	$1976.7	22.18%	120.42%	$528.0
Road accidents	$2202.0	22.18%	116.98%	$571.4
Crime	$1726.1	22.18%	116.98%	$448.0
Indirect costs				
Labour in the workforce and household less consumption resources saved	$4293.7	22.18%	118.77%	$1128.7
Resources used in abusive consumption	$1688.8	22.18%	116.98%	$438.2
Intangible costs				
Loss of life and pain and suffering	$4488.7	22.18%	116.98%	$1164.8
Total	**$15,318.2**			**$4279.1**

Source: Collins and Lapsley 2008 and the Allen Consulting Group. Note: the difference between the total presented above and the total in Table 2.2 can be attributed to the additional cost of emergency departments ($1.6 million) and government education, promotion and research programs. Neither of these costs were derived from the Collins and Lapsley (2008) estimates.

The majority of these costs are tangible costs (73 per cent) – comprising 46 per cent of direct costs and 27 per cent of indirect costs. Intangible costs account for 27 per cent of the total — see Figure 2.2.

Figure 2.2

SOCIAL COST OF ALCOHOL-RELATED HARM IN VICTORIA BY TYPE



Source: The Allen Consulting Group.

Table 2.2 provides a summary of the total social cost of alcohol-related harm for Victoria by cost type. The single largest contributor to the overall cost is the intangible cost associated with loss-of-life (25 per cent of the total). The second largest contributor is the cost associated with reductions in the workforce from alcohol-related harm, an indirect cost that accounts for 14 per cent of the total.

Table 2.2

TOTAL VICTORIAN COSTS BY TYPE

Type of costs	Alcohol ($m)	Alcohol and illicits together ($m)[b]	Total costs ($m)	Percentage of total costs
Healthcare				
Medical	144.4		144.4	3.36%
Hospital	176.9		176.9	4.12%
Emergency department presentations	1.6		1.6	0.04%
Nursing homes	107.2		107.2	2.50%
Pharmaceuticals	79.5		79.5	1.85%
Ambulances	20.0		20.0	0.47%
Total healthcare	**529.6**		**529.6**	**12.33%**
Road accidents	**571.4**		**571.4**	**13.30%**
Crime				
Police	193.9	83.1	277.0	6.45%
Criminal courts	22.3	7.3	29.5	0.69%
Prisons	36.8	38.0	74.8	1.74%
Property	17.4	37.5	54.9	1.28%
Insurance administration	3.7	8.0	11.7	0.27%
Total crime	**274.1**	**173.9**	**448.0**	**10.43%**
Resources used in abusive consumption	438.2		438.2	10.20%
Total direct costs	**1813.3**	**173.9**	**1987.2**	**46.25%**
Labour in the workforce				
Reduction in workforce	845.9		845.9	14.31%
Absenteeism	96.9		96.9	1.64%
Productivity of prisoners	96.0	100.1	196.1	3.32%
Total labour in the workforce	**1038.8**	**100.6**	**1138.9**	**19.26%**
Labour in the household				
Premature death	375.1		375.1	6.34%
Sickness	38.7		38.7	0.65%
Total labour in the household	**413.8**	**0**	**413.8**	7.00%
Total paid and unpaid labour costs	**1452.6**	**100.6**	**1553.2**	**26.26%**
Less consumption resources saved[a]	-424.5		-424.5	
Government education, promotion and research programs	14.9		14.9	0.35%
Total indirect costs	**1043.0**	**100.6**	**1143.6**	**26.63%**
Loss of life	1073.0		1073.0	24.98%
Pain and suffering (road accidents)	91.8		91.8	2.14%
Total intangible costs	**1164.8**		**1164.8**	**27.11%**
Total costs to Victoria	**4021.1**	**274.5**	**4295.6**	**100.00%**

Source: The Allen Consulting Group. Note: [a] the consumption resources saved as a result of reduced labour in the workforce and household have been attributed to the costs generated on a pro-rata basis. [b] Collins and Lapsley do not record costs against all categories for "alcohol and illicits together".

Direct costs

The direct cost contribution to the total social cost of alcohol-related harm in Victoria is estimated to be approximately $2 billion in 2007-08 — or 46 per cent of the total. These direct costs are generated by:

- *healthcare required as a result of alcohol-related harm*: which includes medical, hospital, emergency department, ambulance, pharmaceutical and nursing home costs;
- *road accidents attributable to alcohol-related harm*: this includes the cost of legal services, motor vehicle towing and repairs and the cost of fire and emergency services attending the scene;
- *crime attributable to alcohol-related harm*: this includes the cost of police responding to a call-out, the cost of criminal courts and prisons where a person is charged, as well as the costs incurred by the destruction of property; and
- *resources used in abusive consumption of alcohol*: this includes the resources devoted to satisfying those consumption demands (eg: purchasing alcohol) that would have been released for other consumption or investment purposes if no alcohol-related harm occurred (Collins and Lapsley 2002).[1]

In relation to the above direct costs, the healthcare costs are borne by government, and the foregone investment and consumption resulting from abusive consumption of alcohol can be attributed to individuals and business. It is not possible, however, to separate out the costs borne by government and those borne by individuals and business for road accidents and crime that have been generated by Collins and Lapsley (2008).

As Figure 2.3 illustrates, the largest direct social cost is the result of road accidents, which is estimated to cost approximately $571.4 million in 2007-08. By way of comparison, Connelly and Supangan (2006) estimated that the total cost of road traffic accidents in Victoria was in excess of $4 billion in 2003. Of this, the direct general and vehicle costs represented 44 per cent of the total or $1.8 billion. The Victorian Government has estimated that approximately one-third of road accidents are related to alcohol (Victorian Government 2008a) — totalling approximately $600 million, which is broadly consistent with the estimate developed in this study.

The second largest contributor to the direct social cost is the demand for healthcare services resulting from alcohol-related harm. It is responsible for 27 per cent of the direct costs and is estimated at $529.6 million. By way of comparison, in 2004-05, approximately $16 billion was spent on health care in Victoria (ABS Cat no. 4364.0, 2006) — and, of this total, approximately 2.7 per cent can be attributed to alcohol-related harm.[2] This is broadly consistent with *The Victorian Burden of Disease Study* that found alcohol-related harm directly accounts for 3.2 per cent of the total burden of disease in this state (Victorian Department of Human Services 2005).

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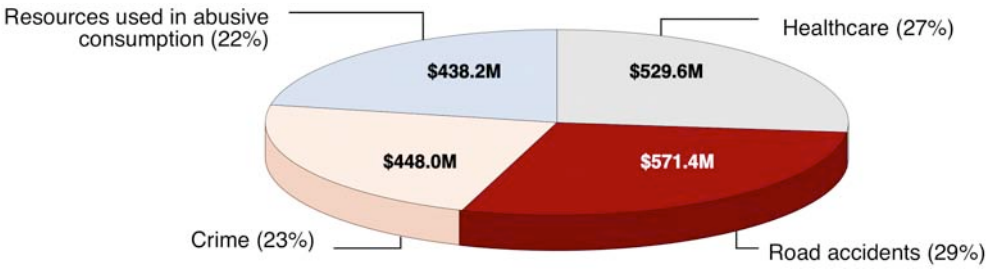
[1] It is assumed that the proportion of alcohol consumption that is abusive is 30 per cent. The total estimate for the resources used in abusive alcohol consumption is $1.69 billion. (Collins and Laplsey 2008, p 5)

[2] Note: This has been estimated by dividing the total cost of alcohol-related harm in Victoria for 2004-05 (based on the Collins and Lapsley (2008) estimate) by the total Victorian estimate for healthcare costs (ABS Cat no. 4364.0 2006).

Figure 2.3

DIRECT SOCIAL COSTS OF ALCOHOL-RELATED HARM



Source: The Allen Consulting Group.

Indirect costs

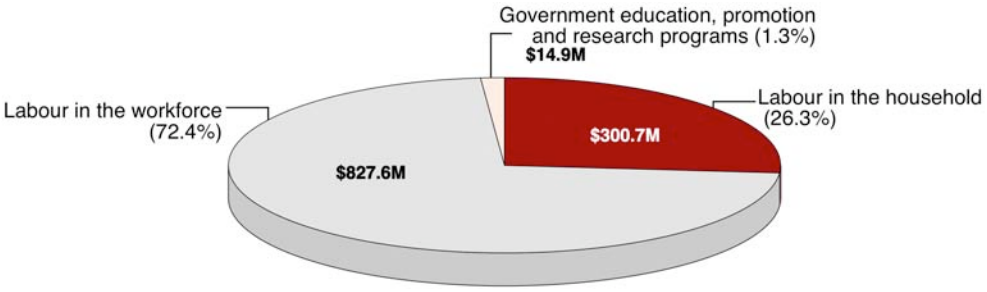
The indirect cost of alcohol-related harm in Victoria in 2007-08 is estimated to be $1.1 billion or 27 per cent of the total. Indirect costs are generated by:

- *a reduction in labour in the workforce*: this includes the cost to business and government (a large employer in Victoria) through absenteeism, reduced workforce size and foregone productivity from individuals convicted for alcohol-attributable crime or who are unable to work as a result of alcohol-related harm;
- *a reduction in labour in the household through sickness or death*: this is the value of unpaid work lost through alcohol-related sickness and death; and
- *government investment in education, promotion and research programs*: this covers the cost of public education programs about appropriate alcohol consumption levels, as well as additional research.

Figure 2.4 provides a breakdown of the indirect costs captured in this analysis. The cost of foregone participation in the workforce is the largest single contributor to indirect costs. It is estimated to cost the Victorian economy $827.6 million in lost productivity or 27 per cent of total social costs. However this is likely to be an underestimate of total production losses in the workforce as, similar to Collins and Lapsley (2008), there was not sufficient information to quantify the losses stemming from on-the-job productivity for this assessment.

Figure 2.4

INDIRECT SOCIAL COSTS OF ALCOHOL-RELATED HARM



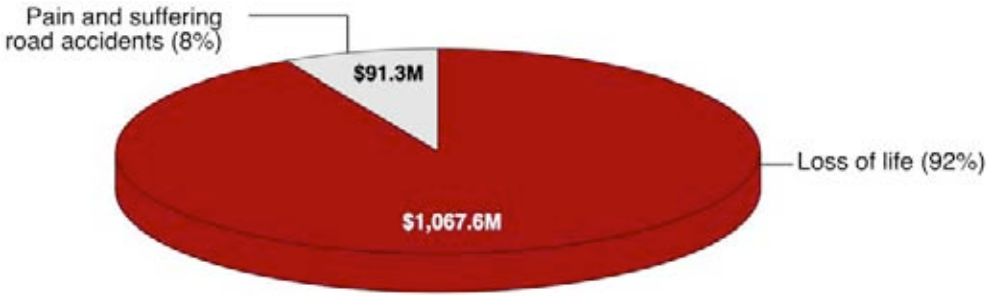
Source: The Allen Consulting Group. Note: the discrepancy between the total presented in Figure 2.4 and Table 2.2 is the result of rounding error.

Intangible costs

The intangible cost of alcohol-related harm in Victoria is estimated to be $1.2 billion in 2007-08. Intangible costs include the valuation of loss of life and the pain and suffering attributable to alcohol-related harm. As Figure 2.5 demonstrates, the majority of costs in this category (92 per cent) are generated by estimates of the loss of life through alcohol-related harm. The Collins and Lapsley (2008) study estimates the value of one year's loss of life at approximately $53,267.

Figure 2.5

INTANGIBLE SOCIAL COSTS OF ALCOHOL-RELATED HARM IN VICTORIA



Source: The Allen Consulting Group.

Another comparison can be made using *The Victorian Burden of Disease Study: Mortality and Morbidity in 2001*. This study used a disability-adjusted life year (DALY) metric; where a DALY can be thought of as the loss of one year of 'healthy' life. Updating estimates from this study to 2007-08 (assuming Victorian population growth), it is estimated that 21,744 DALYs can be attributed to alcohol consumption. Dividing the total intangible cost of alcohol-related harm in Victoria by these DALYs, suggests the value of one year of 'healthy' life is more than $50,000. This is comparable with the estimate made by Collins and Lapsley (2008) for the average intangible value of the loss of one year's living.

2.4 Cost to the Victorian Government

The cost of alcohol-related harm to the Victorian Government is estimated at $366 million in 2007-08. Table 2.3 provides a summary of the cost estimate to the Victorian Government by type.

Table 2.3

TANGIBLE COSTS BORNE BY THE VICTORIAN GOVERNMENT

Type of cost	Collins and Lapsley state government budget estimates ($m)	Population adjustment	Updating for 2007/08	Cost to Victorian Government ($m)	Proportion of costs
Direct outlays					
Healthcare					
Hospitals	$251.7	22.18%	120.42%	$67.2	18.4%
Nursing homes	$15.4	22.18%	120.42%	$4.1	0.4%
Emergency departments[a]	N/A	N/A	N/A	$1.6	1.1%
Ambulances	$34.3	22.18%	120.42%	$9.2	2.5%
Total Health	**$301.4**	**22.18%**	**120.42%**	**$82.1***	22.4%
Road accidents	**$87.8**	**22.18%**	**116.98%**	**$22.7**	6.2%
Crime					
Police	$747.1	22.18%	116.98%	$193.9	53.0%
Criminal courts	$85.8	22.18%	116.98%	$22.3	6.1%
Prisons	$141.8	22.18%	116.98%	$36.8	10.1%
Total crime	**$974.6**	**22.18%**		**$252.9**	69.1%
Indirect outlays					
Government education and research programs[a]	**N/A**	**N/A**	**N/A**	**$7.1**	1.9%
Foregone payroll tax[a]	**N/A**	**N/A**	**N/A**	**$1.0**	0.3%
Total outlays					
Total outlays	**$1363.8**			**$366.0**	

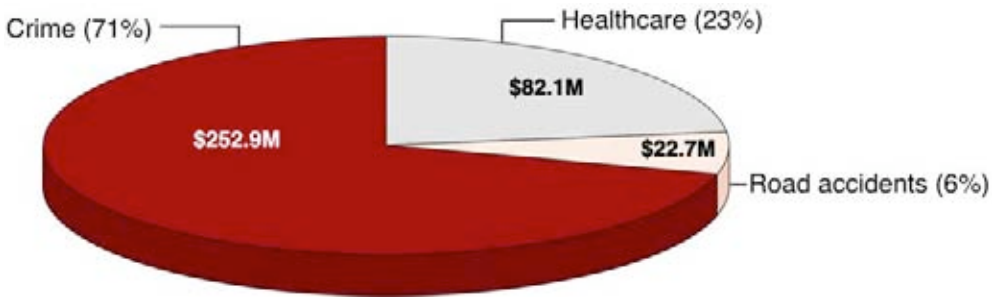
Source: The Allen Consulting Group.
Note: [a] N/A denotes alternative methodological approach. *This estimate may be low based on advice from the Victorian Department of Human Services as the Victorian Government spent in excess of $50 million in 2007-08 on direct alcohol treatment costs — the majority of which did not occur in a hospital setting.

Direct costs

Direct costs account for more than 97 per cent of the Victorian Government cost burden. The cost of crime, particularly policing costs, makes up the largest proportion of direct costs at 53 per cent. It is estimated that the Victorian Government spent $252.9 million on alcohol-related crime of which $193.9 million was on policing.

Figure 2.6

VICTORIAN GOVERNMENT'S DIRECT COST BURDEN



Source: Allen Consulting Group.

Indirect costs

Indirect costs to the Victorian Government account for $8.1 million in 2007-08. The types of costs included in this category are:

- Victorian Government education and research programs ($7.1 million)
- foregone payroll tax ($1 million).

Foregone payroll tax has been included as has been to account for the impact on the Victorian Government for the reduction in labour in the workforce due to alcohol consumption. This cost probably represents an underestimate of the true impact on the Victorian Government because this calculation only considers the reduction in payroll tax as a result of alcohol-related deaths and does not quantify the payroll tax foregone from alcohol-related abuse.

2.5 Discussion and conclusion

Based on the methodology outlined in this report, the total social cost of alcohol-related harm to Victoria is estimated at more than $4 billion in 2007-08. Of these costs, the burden borne by the Victorian Government is $366 million, or approximately 9 per cent of the total, or approximately 13 per cent of total tangible costs. These proportional estimates are similar to those derived by Collins and Lapsley (2008). For instance, the proportion of state and territory government costs of total national tangible costs is 12.5 per cent, which indicates the methodology applied in this project is consistent with that of the source study.

When comparing the difference between total social costs and total government costs in Victoria, the results suggest that a large proportion of the costs of alcohol-related harm are borne by the non-government sector. Of these, intangible costs ($1164.5 million) and indirect costs due to production losses in the workforce and at home (totalling $1143.6 million) account for more than half of total Victorian social costs. The majority of road accident costs ($549 million out of $571 million) are also borne by the non-government sector (in Victoria these are covered by the Transport Accident Commission). These three areas of non-government costs account for approximately 70 per cent of total Victorian social costs, and explain why government costs are significantly lower. The remaining 10 per cent is attributed to the costs associated with abusive resource consumption — an opportunity cost measure of alcohol consumption — totalling over $438 million in 2007-08.

It is noted that, in relation to the Victorian Government, just over half of government costs (53 per cent) are accounted for by policing, with 18.4 per cent attributed to health care. Of these health care costs, 81 per cent accrue to the acute health or hospital sector, indicating the seriousness of associated harm from excessive alcohol consumption.

It is also useful to examine impact of the government's cost burden on the Victorian population as well as on a rural-urban split.

On a per capita basis, Victorian Government expenditure on alcohol-related harm amounts to $69 per person. While it is difficult to assess whether this figure is high or low, another way to consider this issue is that only a small segment of the population (approximately 12 per cent) is engaging in the risky behaviour that is associated with alcohol-related harm. When considering this population only, the expenditure incurred is much higher at $703 per person.

When examining this issue on a rural-urban split, analysis suggests that 75 per cent of costs ($274.5 million) of the burden to Victorian Government) results from alcohol-related harm in metropolitan Victoria. However this approach may underestimate the impact of alcohol-related harm in rural and regional areas as alcohol consumption may be disproportionately higher in these areas. For example, the *2004 Victorian Youth Alcohol and Drug Survey* found that more young people living in regional Victoria consumed alcohol at levels that put them at high risk of harm than those in metropolitan areas (Premier's Drug Prevention Council 2005).

Methodological considerations

This part of the review has estimated the total social costs of alcohol-related harm in Victoria in 2007-08 as well as the impact on Victorian Government outlays. In doing so, it has relied extensively on the estimates produced by Collins and Laplsey (2008). It has endeavoured to make explicit assumptions for the derivation of Victorian estimates, noting that such estimates are indicative and a proxy for actual Victorian costs. It is likely that these costs underestimate the real costs faced by the Victorian Government as they represent a partial approach and it has not been possible to include all relevant costs (such as the cost of domestic violence from alcohol-related harm, and lost productivity).

The Allen Consulting Group notes that the timeframe for this analysis has precluded the estimation of actual costs for alcohol-related harm using a "bottom-up" approach. For the actual derivation of risk-based license fees, it is recommended that the estimation of costs are best approximated using a measure of government outlays associated with the costs of alcohol-related harm. Appendix B outlines some of the relevant data sources needed for this activity. This will provide a more accurate calculation of Victorian Government outlays than has been possible in this report.

This stage of the review has also outlined the high-level methodology for calculating such estimates and the data sources from where they are derived. This work will provide an input into the next phase of the project, which considers the data limitations and future needs for the development of licensing fee structures.

A specific consideration for the next part of this review is the proportion of total Victorian Government costs that should be passed on to licensees. This issue and others will be examined in the following chapters of this report which:

- identifies whether links exist between alcohol-related harm and the operation of licensed premises; and
- identifies risk factors associated with the operation of licensed premises that indicate higher risks of alcohol-related harm.

Chapter 3

Literature review: the link between alcohol-related harm and licensed venues

This chapter examines the link between alcohol-related harm and licensed premises through two related inquiries.

- *Firstly, how is alcohol-related harm linked with the operations of licensed premises?*
- *Secondly, what factors associated with licensed premises indicate higher risk of alcohol-related harm?*

The discussion suggests there is a link between alcohol-related harm and licensed premises, and that the nature and extent of harm varies by venue type. There is also evidence to suggest that certain characteristics and practices of licensed premises are risk factors for alcohol-related harms. This chapter assesses the relative determinative strengths of these risk factors and prioritises those factors most relevant for the review, and more particularly, for the design of a risk-based licensing framework.

3.1 How is alcohol-related harm linked with the operations of licensed premises?

This section reviews empirical evidence of the link between alcohol-related harm and licensed premises, with a focus on harm related to assault. A number of studies show that the nature and extent of alcohol-related harm varies across licensed premises. This variation is explained by the existence of identified risk factors, some of which licensed premises can directly influence.

Alcohol is a major risk factor for a range of harms in an Australian setting (see Collins & Lapsley 2008a). The links between harm and licensed premises is significant for policymakers, as licensed premises are intended, through legislation, to provide a safe and controlled environment for alcohol consumption (Wiggers et al. 2004). Several Australian studies have examined the link between licensed premises and specific types of harm, some of which are identified in Table 3.1.

This table demonstrates there is a substantial body of literature examining the link between alcohol-related harm and assault, with much evidence suggesting a causal relationship. For instance, in 1999-2000, licensed premises were the third most frequent type of premises (behind 'residential' and 'outdoors') for reported assault incidents in New South Wales, with data suggesting that 66.7 per cent of all assaults in that year were alcohol-related (Briscoe & Donnely 2003b). In addition, a study of assault incidents in Sydney (Jochelson 1997) found that 42 per cent of assault incidents occurred in or around licensed premises.

Table 3.1

ALCOHOL-RELATED HARMS AND LICENSED PREMISES: AUSTRALIAN STUDIES

Harm	Studies linking with licensed premises
Assaults	Ireland & Thommeny 1993 Jochelson 1997 Briscoe & Donnely 2001 Chikritzhs & Stockwell 2002 Daly et al. 2002 Briscoe & Donnely 2003b
Malicious damage	Ireland & Thommeny 1993
Offensive language, behaviour	Ireland & Thommeny 1993
Noise complaints	Ireland & Thommeny 1993
Drink driving and road accidents	Daly et al. 2002 Chikritzhs & Stockwell 2006
Falls and other accidents	Chikritzhs et al. 1999
Health risks	Chikritzhs et al. 1999

These studies establish a direct link between licensed premises and alcohol-related harms. However, this association is not consistent across all licensed premises. One Australian study (Homel & Clark 1994) found that over three quarters of incidents involving physical aggression were concentrated in less than one fifth of licensed sites, with two-thirds of sites recording no violent incidents at all. These findings are consistent with those of international studies (such as Sherman, Rogan & Velke 1991[3]), which consistently find that '... a small minority of problematic licensed premises are associated with the vast majority of alcohol-related problems' (Briscoe & Donnelly 2003b; Loxley et al. 2005). This suggests that risk-based approaches to licensing, inspection and enforcement may be particularly effective for reducing alcohol-related harm.

As one example, Box 3.1 sets out the findings of a study of assaults that occurred on licensed premises in inner urban locations in New South Wales. The study found that a small minority of licensed premises accounted for a disproportionately large share of all assaults that occurred on licensed premises. These findings suggest that not only are some licensed premises more likely to be associated with alcohol-related harm than others (for example, hotels and nightclubs), but that *certain characteristics* of licensed premises are associated with this harm.

[3] In a study of taverns in Milwaukee, Sherman, Rogan & Velke found that more than half of all violent offences at taverns reported between 1986 and 1989 were located at 12 per cent of all taverns. Forty per cent of taverns in this area had no violent incidents over the same period.

Box 3.1

LICENSED PREMISES AND ASSAULTS: EXPERIENCE IN NEW SOUTH WALES

This study examined the distribution of police-recorded assault incidents for licensed premises in inner Sydney, Newcastle and Wollongong over a 2-year period (July 1998 to June 2000). The study found that a small minority of licensed premises accounted for a disproportionately large share of all assaults that occurred on licensed premises, as follows:

- in inner Sydney, 12 per cent of hotels and nightclubs accounted for almost 60 per cent of all assaults at hotels and nightclubs;
- in inner Newcastle, 8 per cent of licensed premises accounted for nearly 80 per cent of all assaults on licensed premises; and
- in inner Wollongong 6 per cent of all licensed premises accounted for 67 per cent of all assaults on licensed premises.

The study also found that certain characteristics of licensed venues were associated with the occurrence of assault. As an example, hotels and nightclubs were found to be most problematic for violence across all types of licensed premises. In particular, hotels with extended or 24-hour trading recorded a greater number of assaults compared with those trading standard hours.

Source: Briscoe & Donnelly 2003b.

A number of other studies suggest that certain identifiable characteristics are associated with elevated risks for alcohol-related harm (see Green & Plant 2007; Doherty & Roche 2001), and that multiple factors contribute to such harm.

> The drinking setting can exert considerable influence on behaviour through expectations, physical and social characteristics of the environment, levels of intoxication allowed and the characteristics of others in the setting (Graham & West 2001, cited in Briscoe & Donnelly 2003b).

While some risks are associated with the types of patrons at licensed premises, the physical and social environments may contribute to risk of harms, even controlling for the characteristics of the drinker (Graham et al. 2006). Accordingly, controlling drinking environments is recognised as a key intervention for reducing alcohol-related harm (Collins & Lapsley 2008a).

3.2 What factors associated with licensed premises indicate higher risk of alcohol-related harm?

A substantial body of empirical research demonstrates that alcohol-related harm is associated with certain characteristics and practices of licensed premises. This section reviews the literature to identify relevant risk factors for alcohol-related harm and then attempts to assess the relative determinative strengths of such risk factors. The five risk factors most relevant to alcohol-related harm are identified.

What are the risk factors?

A range of factors in the physical, social and regulatory environments — both internal and external to licensed premises — influence the nature and extent of alcohol-related harm associated with licensed premises (see Figure 3.1). These factors demonstrate the complex relationship between alcohol-related harm and licensed premises. There are multiple and intersecting factors that contribute to alcohol-related harm — some of which can be controlled by licensed premises and others that are clearly external. Many of the factors are known to be compounding — as one example, overcrowding can combine with patron intoxication, lighting, loud nose and poor ventilation to elevate the risk for a range of alcohol-related harms. Other factors have been shown to reduce alcohol-related harm, such as visibility of police and adequate lighting.

Figure 3.1

FACTORS ASSOCIATED WITH LICENSED PREMISES THAT INFLUENCE ALCOHOL-RELATED HARM

	Physical environment factors	Social / regulatory factors
Internal	• Crowding • Entertainment • Lighting • Seating • Bar placement • Drink containers • Bar size • Ventilation • Air-conditioning • Entrances and exits • Cleanliness • Physical hazards • Provision of food	• Intoxication • Drinks promotions • Social mix • Patron type (age, gender) • Permissive attitudes • Attitudes to drunkenness • Licensed venue policies and practices • Crowd controller/door staff behaviour/practices • Bar staff behaviour and practices • Management practices and policies • Police activities and responses • Enforcement of legislation
External	• Road design • Rubbish bins • Location of public phones • Location of amenities • Location and number of taxi ranks • Location of bus facilities • Cleanliness of environments • Design of city, town or entertainment centre • Number and density of licensed venues • Number and type of other businesses • Operating hours of licensed venues • Lighting • CCTV • Location of fast food outlets • Proximity of licensed premises to domestic premises	• Visibility of police • Communication between security personnel and police • Behaviour of licensed premises security staff • Behaviour of police • Enforcement activities of police • Dry zone • Type of licensed premises (mix) • Enforcement of legislation

Source: Doherty & Roche 2003.

Several frameworks for mapping the risk factors for alcohol-related harm have been proposed in the literature — Figure 3.1 provides one example. Other notable frameworks include:

- Green & Plant (2007), which organises risk factors in terms of: physical characteristics and atmosphere; organisational factors; patron characteristics; beverage choice; and external characteristics; and

- Graham et al. (2004), which organises risk factors in terms of: the physical environment; the social environment; patron characteristics; staff; and vicinity.

These examples suggest a common understanding of the population of risk factors, with some variations in how these factors are organised within each framework. This review refers to the Doherty & Roche (2003) framework because it clearly delineates those factors that can be influenced by different parties (eg: venue operators and government), which is an important consideration within a licensing context.

For instance, venue operators have the greatest capacity to control those factors within the internal, physical environment, such as providing food and maintaining a clean facility. Governments in contrast have the capacity to set regulations, which in turn influence the internal environment, as well as the external environment — such as the availability of public transport.

Each risk factor is associated with specific types of alcohol-related harm. As examples, aggressive behaviour and violence have been linked with factors such as patron intoxication, patron characteristics (such as young people and groups of males), staff training and coordination. Venue size, crowding, noise, lighting, cleanliness, drinks promotions and operating hours are all also strong predictors of alcohol-related harm (Green & Plant 2007; Chikritzhs et al. 1997; Graham et al. 2004). Patron intoxication, which represents a harm in itself as well as being a risk factor for many other alcohol-related harms, is associated with staff practices (principally responsible service of alcohol practices), drink promotions, and types of entertainment (Daly et al. 2002).

The empirical evidence for specific risk factors varies in its completeness and consistency (Plant et al. 2007). A notable example of this is the density of alcohol venues as a risk factor for alcohol-related harm, which is discussed in Box 3.2.

Box 3.2

LICENSED OUTLET DENSITY AND HARM

Studies examining the relationship between the density of licensed outlets and harm have produced mixed findings.

Some studies have found positive relationships between outlet density and certain harms, including: violence, drink driving, motor vehicle accidents, amenity issues and others. As one Australian example, an analysis of alcohol-related problems in New South Wales (Donnelly et al. 2006) found that residents in areas with a higher density of licensed premises were more likely to report problems from drunkenness, after controlling for socio-demographic factors.

However, the exact nature of the relationship between outlet density and harm varies across different studies, as shown in a review of the literature on relationships between outlet density and violence (Livingston et al. 2007). This review found a consistent relationship between outlet density and violence, although it found variation in the range of conditions where this relationship was significant. For instance, some studies reviewed reported significant relationships between alcohol-related harm and the density of certain venue types (such as bars and nightclubs); others reported the existence of certain socio-economic characteristics as important, with one study finding outlet density 'thresholds' to be a determinant of alcohol-related harms.

Other studies have provided evidence for the existence of a relationship between outlet density and harm, but questioned the causal relationship. In one study of crime rates in Cleveland, Roncek & Maier (1991) found that the amount of crime — including murder, rape, robbery, aggravated assault, burglary, and grand theft — was significantly higher on residential blocks with licensed venues than those without, after controlling for a range of social and demographic factors. However, the authors urged caution in attributing these findings to the consumption of alcohol. Other studies that have examined different non-residential land uses (such as high schools, fast food restaurants or shopping centres) also found similar effects, without any direct association with alcohol use. The authors point to the so-called 'routine activities theory' which points to any congregation of people as an environment that presents heightened levels of opportunities for crime to occur.

Given the inconsistent interpretation of the relationship between outlet density and harm, outlet density is not further considered in this review.

Sources: Livingston et al. 2007; The Allen Consulting Group 2006; Gyimah-Brempong & Racine 2006; Gorman et al. 2001; Donnelly et al. 2006; Roncek & Maier 1991.

Which factors are the most strongly associated with alcohol-related harm?

The literature recognises that certain characteristics and practices of licensed premises are more strongly associated with alcohol-related harm than others. This section identifies five risk factors that are strongly associated with alcohol-related harm, and which are reasonable factors to consider within a licensing context. Two criteria are proposed to guide the assessment of the relative strength of each risk factor, as follows:

- *empirical evidence* — there is a body of empirical evidence that demonstrates that the risk factor is important and that the impacts are detrimental; and
- *feasibility as a basis for risk-based licensing* — the extent to which the risk factor can be used as a basis for risk-based licensing, which is dependent upon:
  - whether there are reasonable measures that a licensee can take to influence the risk factor
  - whether it is possible (from the perspective of the Department of Justice) to measure and assess the extent to which a licensee has attempted to control the risk factor.

The application of these criteria to the literature reviewed for this study indicates five risk factors: operating hours, patron intoxication, extent of overcrowding, staffing and management practices, and venue type. Each of these risk factors is discussed below.

Operating hours (internal/regulatory factor)

Australia has long regulated the operating hours of licensed premises. Over recent decades, there has been a trend towards progressively lengthening operating hours, while some jurisdictions internationally have removed these regulations entirely (Chikritzhs & Stockwell 2002).

There are some alcohol-related harm arguments to support extending or even deregulating operating hours. Some suggest that extending operating hours may reduce an individual's overall alcohol consumption, as an individual may be better able to 'pace themselves' over an extended period of time. Extending operating hours may also prevent the simultaneous exodus of patrons from licensed premises at closing time, thereby avoiding any associated public disorder and violence. However, there are also suggestions that patrons already at risk of alcohol-related harm are more likely to take advantage of extended trading hours, and are either not inclined or less able to regulate their drinking (Chikritzhs & Stockwell 2002).

A substantial body of empirical research identifies operating hours as a key determinant of alcohol-related harm. For instance, a study of the impacts of extending the operating hours of some licensed premises in Perth between 1989–1996 found that the assault rate associated with those licensed premises more than doubled while remaining static for premises without extended trading (Chikritzhs et al. 1997). In another study in Perth (Chikritzhs & Stockwell 2006), extended trading was associated with increased levels of impaired driver road crashes and alcohol consumption.

Studies in New South Wales have also found that assaults at licensed premises were more likely to occur during extended trading periods, most frequently between midnight and 3am (Jochelson 1997; Briscoe & Donnelly 2001). A 2007 study by the City of Sydney into violence in the Oxford St Precinct found that the majority of crime occurred between 11pm and 4am (Friday to Sunday) — corresponding with the times when late trading licensed venues were the most active, and when the volume of visitors to the Oxford Street Precinct was highest (City of Sydney 2007).

Operating hours would present a feasible factor to consider within a risk-based licensing framework. While those licensees that may choose to trade for longer hours may pay a higher associated fee reflecting the increased association with alcohol-based harm (eg: similar to the Queensland model), it nevertheless is accepted that venue operators have a limited degree of control over this factor. However, notwithstanding this — operating hours provide a robust characteristic that can be used to identify those licensed premises that are more likely to be associated with alcohol-related harm — noting compliance with operating hours would be monitored and enforced through existing processes.

Patron intoxication (internal factor)

Patron intoxication at licensed premises is recognised as a principal contributor to alcohol-related harm.

> One of the most important situational determinants [of alcohol-related problems] is alcohol intoxication (Graham et al. 1998 cited in Doherty & Roche 2003).

The research literature identifies several associations between patron intoxication and alcohol-related harm. Among the strongest of these associations are those between intoxication and acts of aggression, violence and accidental injuries (Doherty & Roche 2003).

Different levels of patron intoxication are associated with varying forms of harm. Mild and moderate intoxication can impair cognitive functioning and can increase the likelihood of aggressive responses to irritation, particularly among men (International Centre for Alcohol Policies 2002). Grossly intoxicated people are less likely to initiate violence, but are more likely to become a victim of alcohol-related aggression and suffer harms such as falls (McLeod et al. 1998 cited in Doherty & Roche 2003).

Licensed premises can take a number of measures to control and influence the level of patron intoxication. Controlling intoxication is recognised as the 'cornerstone of best practice' for licensed premises (Doherty & Roche 2003). Some measures seek to responsibly control the provision of alcohol to intoxicated patrons, such as responsible service of alcohol practices. Others aim to influence the level of patron intoxication, such as through provision of food, entertainment, non- and low-alcohol beverage options, and limiting beverage promotions that encourage rapid consumption (such as 'happy hours').

Most measures intended to limit patron intoxication are dependent on their implementation by licensed premises. The extent to which any measures put in place are actually practised is variable, as a number of studies into responsible service of alcohol practices have found (see Lang et al. 1998).

Crowding (internal factor)

Regulations determine the maximum number of patrons that a licensed venue can accommodate[4]. Overcrowded venues can contribute to alcohol-related harms in several ways, often through interrelationships with other risk factors.

In crowded venues, patrons tend to drink more alcohol to overcome discomfort and anxiety associated with crowding. Crowding also interferes with the ability of staff to determine if a patron is intoxicated, stemming from:

- pressure to serve quickly, reducing attention to the indicators of intoxication
- patrons purchasing drinks on behalf of other patrons
- high levels of noise, impairing the ability of staff to hear verbal cues of intoxication, as well as verbal confrontation that may lead to aggressive acts (Doherty & Roche 2003).

These factors may also adversely influence the desire and capacity of staff to assess and seek confirmation of proof of age by purchasers of alcohol. This may lead to service of underage patrons.

[4] A range of regulations can determine maximum patron numbers at licensed venues, including liquor licensing regulation, local planning requirements, and building code restrictions. In Victoria, all liquor licences designated 'high risk' have specified maximum numbers of patrons on their licence.

Crowding also increases the chances of accidental contact between patrons, with alcohol impairing their ability to respond appropriately (Green & Plant 2007). It may also result in an unwillingness to supply information about any incidents to police (Doherty & Roche 2003).

Licensed premises can take a number of measures to prevent crowding, some of which are set out in Box 3.3. Some of these measures are clearly observable (such as displaying signage of a venue's maximum capacity), while others would require ongoing monitoring to determine compliance (such as complying with the maximum number of patrons set out in a liquor licence).

Box 3.3

MEASURES TO PREVENT CROWDING AT LICENSED PREMISES

Potential measures to prevent crowding in licensed premises include:

- designing or redesigning premises to assist traffic flow and prevent congestion
- removing or limiting physical barriers such as seats and tables in high traffic areas
- incorporating monitored surveillance to identify problems and assist investigations
- seeking planning opinions from local council, health and other providers
- complying with patron numbers set out in the liquor licence
- setting and adhering to minimum staff to patron ratios for bar, management and security staff
- monitoring patron numbers and limiting or eliminating pass outs
- displaying signage regarding maximum capacity
- collaborating with service providers (such as health, fire and liquor licensing authorities) to proactively identify hazards, problem practices and legislative breaches.

Source: Doherty & Roche 2003.

It is important to recognise that overcrowding is not synonymous with larger licensed premises. The literature emphasises the significance of overcrowding as a risk factor for alcohol-related harm, which can occur at licensed premises of all sizes.

Staffing and management practices (internal factor)

A number of staffing and management practices are put forward in empirical research as being risk or protective factors for alcohol-related harms. Particular practices are often proposed in response to specific risk factors[5]. However, several studies consider staffing and management practices collectively, as a determinant of alcohol-related harm (Doherty & Roche 2003; Graham et al. 2004). This section discusses these practices collectively, as well as individually, for those practices most strongly associated with alcohol-related harms.

[5] As an example, responsible service of alcohol training and policy was put forward as a protective factor for patron intoxication.

A number of studies describe 'permissive environments' — those licensed venues where patrons believe they can act aggressively — which are highly relevant to alcohol-related incidents (Green & Plant 2007). The tolerance of staff and management, either implicit or explicit, is a key factor for a range of alcohol-related harms, including aggression and violence (Graham et al. 2004). As an example, more frequent acts of aggression at licensed premises have been linked with the following staffing and management practices:

- low staff to patron ratios;
- staff serving alcohol to intoxicated patrons;
- poorly trained and coordinated staff;
- aggressive security staff; and
- overcrowding (Briscoe & Donnelly 2003b).

There is particularly strong empirical evidence for responsible service of alcohol practices as both a risk and protective factor for alcohol-related harm, and violence in particular (Rydon et al. 1996; Briscoe & Donnelly 2001; Doherty & Roche 2003).

However, several studies have found that responsible service of alcohol training for bar staff is not a strong determinant of actual serving practices (Rydon et al. 2004; Lang et al. 2004). In a study of serving practices in licensed premises in Perth (Rydon et al. 1996), 90 per cent of visits to licensed venues by actors exhibiting pseudo-drunk behaviour resulted in them being served alcohol. Those premises with bar staff trained in responsible service of alcohol refused service to these patrons on only 15 per cent of occasions. The literature strongly recommends consistent and effective enforcement to ensuring responsible service of alcohol (Briscoe & Donnelly 2001).

Many other management practices have been shown to impact alcohol-related harm, and violence in particular, at licensed premises (International Centre for Alcohol Policies 2002). Those risk or protective factors that management can control and influence include: ventilation; lighting; admission of intoxicated patrons; cleanliness; group sizes; patron mix; crowd control policy; and community relationships. Some of those management practices that licensed premises can adopt to prevent alcohol-related harm are set out in Box 3.4.

Box 3.4

RESPONSIBLE STAFFING AND MANAGEMENT PRACTICES AT LICENSED PREMISES

Management:

- ensure sufficient ratio of staff to patrons
- establishing communication systems to help staff seek and assist with problems, and report problems to police and nearby licensees
- facilitating responsible service of alcohol training, and enforcing policy
- displaying a venue policy of accepted standards of dress and behaviour
- training staff in legislation and managing patrons
- identifying to police any illicit drug activity, prostitution, sexual assault and other offending occurring in and around the premises
- working with other service providers to ensure access by patrons to transport
- avoiding unsafe drinks promotions and promotions that encourage deviant behaviour
- establishing and fulfilling codes of practice
- serving food
- preventing intoxicated patrons entering
- ensuring staff comply with legislation and house policies.

Security staff:

- identifying intoxicated, disorderly, offensive and underage patrons
- attaining skills in behaviour management and negotiation
- assisting to facilitate transport for ejected, intoxicated and underage patrons
- recording incidents
- assisting exit of customers
- improving accountability through uniforms, visible identification and establishing a senior security officer to oversee and document all activities.

Bar staff:

- attaining skills in identifying intoxicated and underage patrons
- managing unruly patrons and incidents
- understanding legislative provisions for service to intoxicated and underage patrons
- requesting age identification
- reducing patron frustration and agitation by effectively managing behaviour
- improving accountability by wearing uniforms, visible identification and establishing a senior bar staff member to guide and assist other staff.

Source: Doherty & Roche 2003.

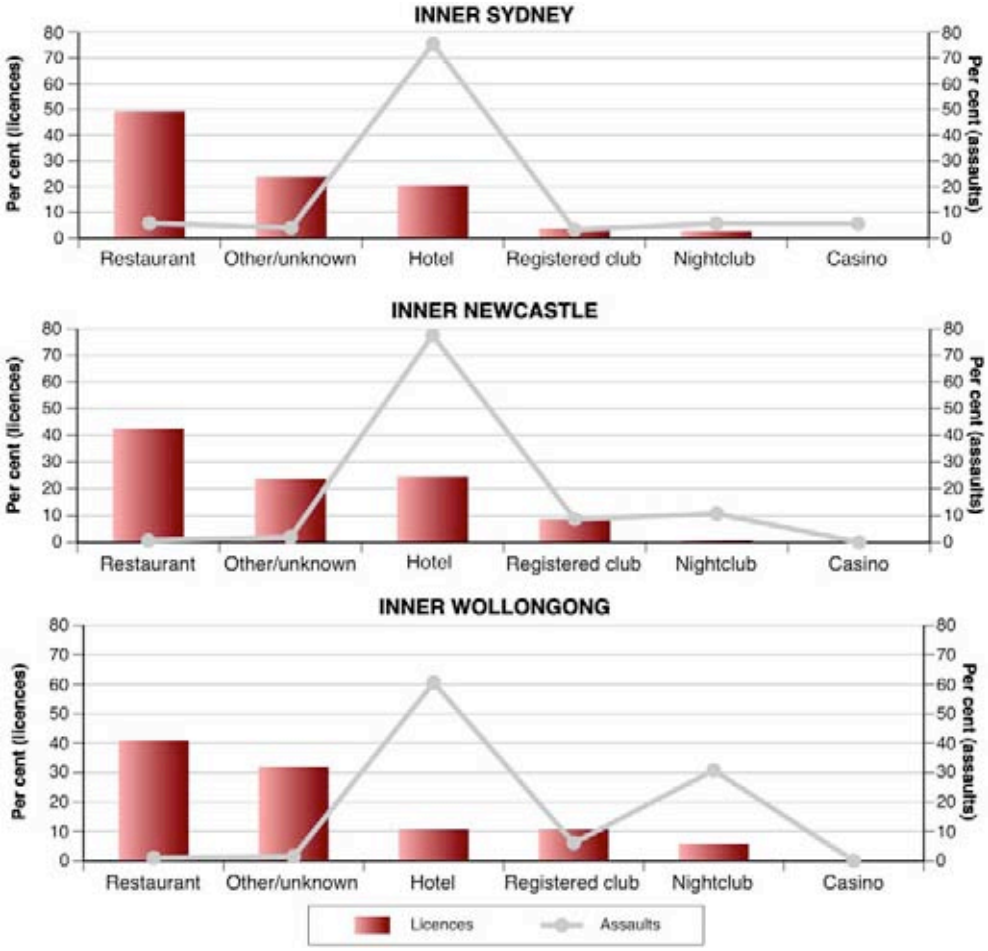
Venue type (internal/regulatory factor)

The nature and extent of alcohol-related harm associated with licensed premises varies across different venue (or licence) types. This was illustrated in the study of assault incidents in inner locations in New South Wales (see Figure 3.2). This study found that the incidence of reported assault incidents was disproportionately distributed across different licence types[6]; with hotels and nightclubs the most problematic for violence in licensed premises.

[6] New South Wales changed its licence types from July 2008. The Hotelier licence has become the Hotel licence, and the Nightclub licence has become the On-premises licence. See <http://www.olgr.nsw.gov.au/pdfs/new_laws_info_010408.pdf> for further information.

Figure 3.2

ASSAULT INCIDENTS AT LICENSED VENUES: EXPERIENCE IN NEW SOUTH WALES



Source: Briscoe & Donnelly 2003b. See Box 3.1 for further details of this study.

There is a body of empirical evidence to support venue type as a determinant of alcohol-related harm (Briscoe & Donnelly 2001). Green & Plant (2007) summarise the variation in alcohol-related harms associated with different venue types, which are set out in Table 3.2.

Table 3.2

VENUE TYPES AND ASSOCIATED ALCOHOL-RELATED PROBLEMS

Venue	Associated alcohol-related problems
Nightclubs	• Large numbers of highly intoxicated patrons • Violent and aggressive incidents • Frequent drug use
Bars and pubs	• Public drunkenness, drunk and disorderly • Drink driving
Event bars (those bars used for special events)	• Vandalism • Violence • Drink driving

Source: Green & Plant 2007.

In interpreting these findings, it is important to note that the causes of these variations are the characteristics of different venue types, many of which have been discussed separately as risk factors. For example, to the extent that a nightclub may have later operating hours than a restaurant, some variation in the experience of alcohol-related harm across these venue types could be expected.

As a result, venue type may represent those risk factors that are not specified separately. For example, other identified drivers of alcohol-related harms associated with nightclubs include: patron characteristics; lack of free water; broken glass; heat; obstructed exits and other factors (Green & Plant 2007).

Including 'venue type' as part of a risk-based licensing framework would enable licensees only a certain degree of control over this factor. That is, beyond changing the venue type, licensees could not control the risk factor. However, venue type provides a robust characteristic that can be used to identify those licensed premises that are more likely to be associated with alcohol-related harm.

3.3 Discussion

The nature and extent of alcohol-related harms varies dramatically between licensed premises. Empirical research shows that certain identifiable characteristics and practices of licensed premises are associated with alcohol-related harms. These factors can be classified as relating to physical, social and regulatory environments. Licensed premises can control and influence some of these factors, while other factors are external.

The literature tends to focus on internal factors as determinants of alcohol-related harm. These factors are highly relevant to licensees and policymakers, as they can be directly influenced or controlled, and are therefore usefully considered in relation to the design of a risk-based licensing framework.

While there is not a distinct hierarchy of risk factors, five risk factors are found to be significant in terms of criteria of empirical evidence and feasibility as a basis for risk-based licensing. These factors include: operating hours, patron intoxication, crowding, staff and management practices, and venue type.

Other factors, such as the provision of food, have been found to be protective factors for alcohol-related harm. Other factors, such as venues that provide sexually explicit entertainment, have not been found to be significantly associated with alcohol-related harm. This is further discussed in the following chapter.

However, while there is available evidence from the literature to suggest that these risk factors are important in explaining alcohol-related harm, the literature does not examine the strength of these relative factors — nor provide definitive answers about which policies are most appropriate to mitigate such risk factors. As such, the next chapter attempts to review the available empirical data — to test whether these risk factors are significant determinants of alcohol-related harm, as well as assess their relative causal contribution. The findings of such analysis will be important in determining the most appropriate risk-based licence fee structure.

Chapter 4

Data review: the link between alcohol-related harm and licensed premises

The previous chapter highlighted the key factors identified in the literature as being most strongly associated with alcohol-related harm at licensed premises. This chapter presents the results of analysis, which tests whether those factors are similarly associated with alcohol-related harm in Victoria. The modelling suggests that three licensed venue risk factors — venue type, late opening hours and venue infringements for intoxication — are all positively correlated with the proxy for alcohol-related harm. This provides empirical evidence for the design of a differentiated risk-based fee structure to reflect the level of risk for licensed premises associated with these factors. There are currently insufficient data to draw any conclusions regarding the risk factors for crowding and staff and management practices.

4.1 Methodological approach

The purpose of the analysis is to assess the strength of the relationship between each of the five risk factors identified in the literature review and venue-specific alcohol-related harm in Victoria. This has been achieved through basic statistical analysis of the available data to indicate high-level trends and findings, as well as more in-depth analysis using regression modelling.

The basic statistical analysis is essentially a straightforward comparison of the proportion of licensed premises, for different groups, that were associated with offences. Regression analysis is more robust and is necessary for drawing firm conclusions regarding relativities between different groups. These analyses are discussed in the following sections, noting further information on the data set and the regression analysis is provided in Appendix C. Key results of the data review are summarised in Appendix E.

The analysis is based on a data set provided by the Department of Justice containing information on a large sample of licensed premises in Victoria. The data set contains venue-specific information on each licensee matched with data on liquor infringement notices and offences in or near licensed premises recorded by Victoria Police. The analysis includes an assessment of risk factors for opening hours, patron intoxication and venue type. However, it does not include risk factors for crowding and staffing and management practices, as the data set did not contain any information regarding these risk factors.

4.2 Data sources

The Department of Justice provided a data set of 6,915 licensed premises in Victoria. The data set contained current venue-specific information on each licensee matched with historic data on liquor infringement notices and offences recorded by Victoria Police. The data available for each of these categories are as follows.

- *Licensee characteristics*: these data include information for each licensee on postcode, region, opening hours, capacity, security requirements and specific activities permitted on premises (i.e. karaoke, adult entertainment, gaming, live/recorded music). Note that this information was not available for all licence types — discussed below.
- *Liquor infringement notices*: these data provided detail on the number notices (for serving and/or permitting entry to an intoxicated person) served to each licensee over the last ten years.
- *Offences recorded by Victoria Police*: these data provided detail on the number of offences (assault, robbery against a person or property damage) over the last ten years that could be linked to a specific venue.

To create the data set for the basic statistical analysis and the regression analysis, data for each licensed venue operating in 2008 was matched with data on how many offences they had been associated with, and how many liquor infringement notices they had received, over the period 2006 to 2008. This data matching exercise was undertaken by the Department of Justice and Victoria Police.

For the purposes of this analysis, the data on offences recorded by Victoria Police were used as a proxy for 'alcohol-related harm', the key variable of interest in this study. Data on liquor infringement notices were used as a proxy for the risk factor 'patron intoxication'.

4.3 Key results

This section outlines the results of the basic statistical analysis as well as the high-level findings of the regression analysis. The results for each risk factor are outlined first, followed by other key results from the basic statistical analysis.

Venue-specific risk factors

The venue-specific risk factors covered below include: late opening hours, patron intoxication and venue type.

Late opening hours

Data on late opening hours were only available in detail for General and On-premises Licensees and in less detail for Packaged Liquor licensees (see Figure D.1 in Appendix D for a break up General and On-premises licensees by venue opening hours).

Basic analysis of the data for General and On-premises licensees suggests a positive relationship between late opening hours and offences in or near licensed premises, as shown in Figure 4.1. In particular, venues opening in the later hours tend to be associated with three or more offences. Note that the unknown group represents those licensees where information on opening hours was not available. It is understood that these venues likely close at 11pm.

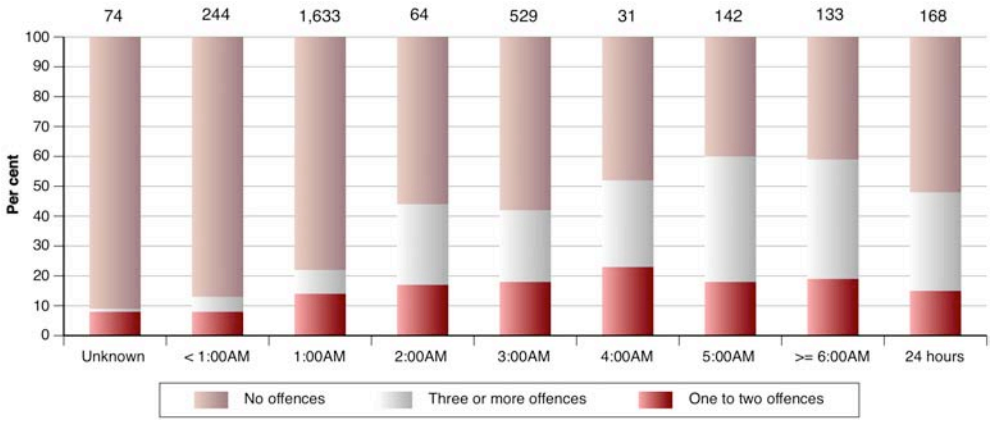
For illustrative purposes, each bar in the figure represents a group of licensees with the same late closing time. The first segment represents the proportion of licensees in the group that were associated with one to two offences over the period 2006 to 2008. The second segment represents the proportion of the group that were associated with three or more offences over the period. The higher the combination of these two segments, the more likely it is that licensees closing at that time will be associated with an offence. Other figures discussed in this chapter can be interpreted in a similar manner. A value is listed at the top of each bar representing the number of venues that fall within that category.

This result is consistent with the results of the regression analysis (see Section 4.4), which suggest evidence of a positive correlation between late opening hours and the rate of offences in or near licensed premises.

The proportion of licensees in each group that have been associated with at least one offence in the last three years ranges from 9 per cent for the venues closing prior to 1am to 60 per cent for venues closing at 5am.

Figure 4.1

PROPORTION OF GENERAL AND ON-PREMISES LICENSEES ASSOCIATED WITH OFFENCES BY LATE OPENING HOURS



Basic analysis of the data for Packaged Liquor licensees, suggests that outlets with non-standard opening hours (i.e. that trade beyond 9am to 11pm Monday to Saturday) are slightly more likely to be associated with an offence. The proportion of licensees associated with at least one offence in the last three years is 4 per cent for outlets with standard hours versus 6 per cent for outlets with non-standard hours.

Patron intoxication

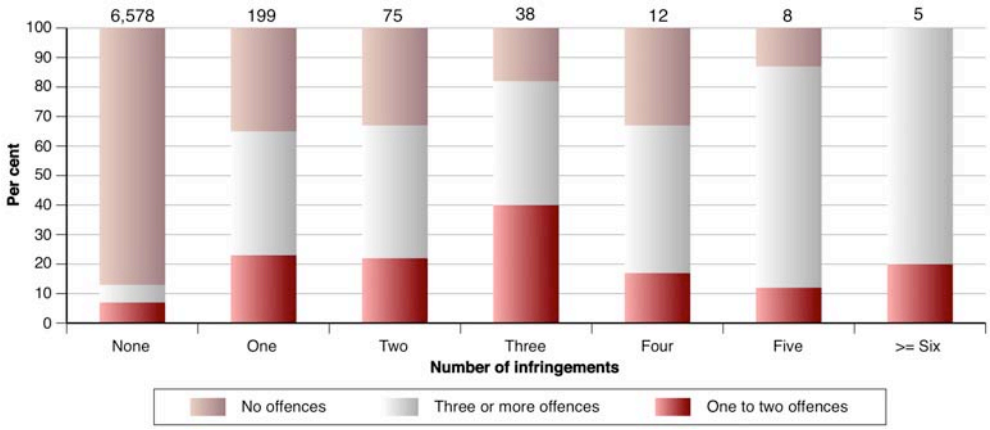
Basic analysis of the data suggests a positive relationship between licensees that have received infringements for patron intoxication and offences in or near licensed premises, as shown in Figure 4.2. In particular, licensees that have received four or more infringements for patron intoxication over the past three years tend to be associated with three or more offences by patrons in or near their venues.

This result is consistent with the results of the regression analysis (see Section 4.4), which suggests evidence of a positive correlation between infringements served to venues and the rate of offences by patrons in or near venues.

The proportion of licensees in each group that have been associated with at least one offence in the last three years ranges from 100 per cent for venues that have been served with six or more liquor infringement notices to 13 per cent for venues that have not been served with any notices over the past three years.

Figure 4.2

PROPORTION OF LICENSEES ASSOCIATED WITH OFFENCES BY NUMBER OF INFRINGEMENTS



The data indicate that the majority of liquor infringement notices served to venues over the last three years were served to General (72 per cent) and On-premises (23 per cent) licensees. Only 4 per cent of notices were served to Full Club licensees, followed by 0.6 per cent for Restricted Club and 0.4 per cent for Packaged Liquor licensees.

Venue type

The data set contains some information on specific activities permitted at licensed premises (i.e. karaoke, adult entertainment, gaming, live/recorded music). This information is available for 30 per cent of General and On-premises Licensees (see Figure D.2 in Appendix D for a break up of General and On-premises licensees by venue type). For Full Club licensees, information is only available to distinguish between gaming and non-gaming venues.

These activities are used in the analysis as a proxy for different venue types. However, it is noted that information on permitted activities is only available for 30 per cent of the General and On-premises Licensees in the data set. It is understood that most gaming, adult entertainment and karaoke venues are identified in the data set, and therefore adequately captured by the relevant venue type categories. However, many live and recorded entertainment venues in the data are not captured by the relevant venue type category. Given this fact, results for the live and/or recorded music category should be interpreted with caution (see Section 4.4 for a more detailed explanation).

Basic analysis of the data for General and On-premises licensees, suggests a relationship between venue type and offences in or near licensed premises, as shown in Figure 4.3. In particular, relative to the unknown group of venues, adult entertainment, live/recorded music, hotel gaming and karaoke venues tend to be associated with three or more offences.

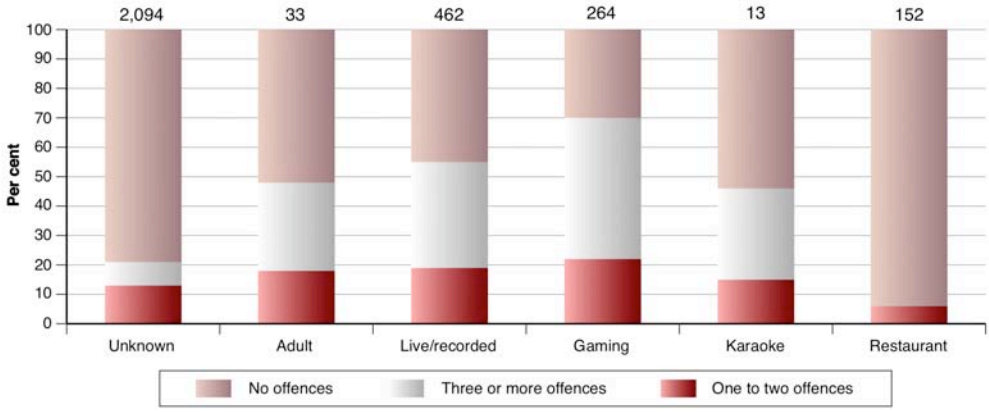
This result is broadly consistent with the results of the regression analysis (see Section 4.4), which suggest evidence of a positive correlation between hotel gaming and live/recorded music venues and the rate of offences in or near licensed premises; a negative relationship for licensees with restaurant conditions; and no relationship for adult entertainment venues — noting that karaoke venues were not included in the regression analysis due to small numbers in the data set. Note that the findings for live and recorded entertainment should be interpreted with caution (see Section 4.4 for a detailed explanation).

The proportion of licensees in each group that have been associated with at least one offence in the last three years ranges from 70 per cent for hotel gaming venues to 6 per cent for licensees with restaurant conditions.

Of particular note is the result for hotel gaming venues. When compared with the unknown group of venues, the proportion of venues associated with at least one offence in the last three years is 49 percentage points higher for gaming venues.

Figure 4.3

PROPORTION OF GENERAL AND ON-PREMISES LICENSEES ASSOCIATED WITH OFFENCES BY VENUE TYPE



Basic analysis of the data for Full Club licensees, suggests that clubs with a gaming licence are more likely to be associated with an offence relative to clubs without a gaming licence. The proportion of licensees associated with at least one offence in the last three years was 32 per cent for clubs with a gaming licence versus 3 per cent for clubs without a gaming licence. Note that this analysis is capturing a different group of gaming premises (Full Club licensees) to those captured in the regression analysis, as the regression analysis was undertaken only for General and On-premises licensees.

Note that it is not possible to determine exactly what is driving the higher rates of offences at venues offering gaming facilities. This may be due to some other factor that is common to gaming venues (aside from late opening hours, venue capacity or infringements for intoxication), rather than the existence of gaming facilities. Whist the causality of a link between gaming facilities and higher rates of offences is not established, the analysis provides very strong results to suggest that licensees offering gaming facilities are likely to be associated with higher rates of offences relative to those that don't offer gaming facilities.

Other key results from the analysis

Aside from the results for the venue-specific risk factors, a number of other key results were drawn from the analysis. These results provide information about venues associated with high rates of offences, differences between licence types, differences between regions and differences according to venue capacity.

Venues associated with high rates of offences

Table 4.1 provides suburb and offence information for 22 venues with the highest rates of offences over the period 2006 to 2008. For example, Venue 1 in Bairnsdale was associated with 8 robberies, 41 assaults and 1 property damage offence, giving a total of 50 offences over the period. This venue had the highest rate of offences over the period.

A key conclusion from Table 4.1 is that the majority of offences relate to assaults. Another conclusion is that venues with high rates of offences are not clustered in a small group of suburbs, rather they are distributed evenly across different suburbs in different regions of the state. Note, however, that these results do not represent the outcomes of a detailed regional/postcode analysis, which is beyond the scope of this study.

Table 4.1

LICENSEES BY SUBURB AND OFFENCE TYPE: VENUES WITH THE HIGHEST RATE OF OFFENCES

Venue	Suburb	Robberies	Assaults	Property damage	Total offences
Venue 1	Bairnsdale	8	41	1	50
Venue 2	Ballarat	10	22	3	35
Venue 3	Narre Warren	8	20	5	33
Venue 4	Rowville	9	18	4	31
Venue 5	Portsea	2	22	4	28
Venue 6	Glen Waverley	13	12	3	28
Venue 7	Echuca	8	14	5	27
Venue 8	Wangaratta	7	13	7	27
Venue 9	Moorabbin	7	16	4	27
Venue 10	Moe	7	17	2	26
Venue 11	Portland	3	18	5	26
Venue 12	Moonee Ponds	8	13	5	26
Venue 13	Sorrento	7	14	4	25
Venue 14	Mildura	6	18	1	25
Venue 15	South Yarra	3	19	2	24
Venue 16	Wodonga	6	16	2	24
Venue 17	Ringwood	7	16	0	23
Venue 18	Preston	5	15	3	23
Venue 19	Fitzroy	9	10	4	23
Venue 20	South Melbourne	8	15	0	23
Venue 21	Traralgon	5	17	0	22
Venue 22	Melbourne	8	14	0	22

Offences by licensee type

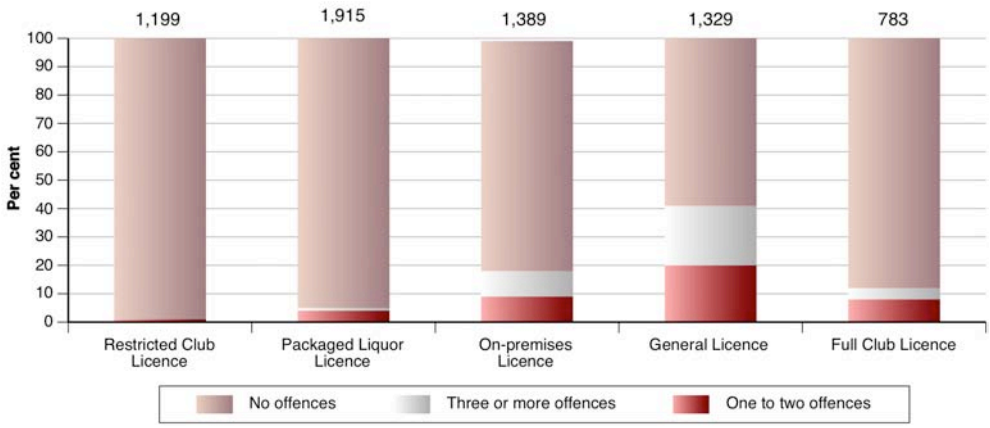
The sample of licensees can be split according to licence type. Packaged Liquor licensees represent the greatest proportion (28 per cent) of the sample followed by General (24 per cent), On-premises (20 per cent), Restricted club (17 per cent) and Full Club (11 per cent) licensees. This is depicted graphically in Figure D.4 in Appendix D. For the purposes of comparison, the make-up of the actual population of licensees at February 2009 was as follows: 1915 Packaged Liquor licensees (11 per cent), 1981 General licensees (11 per cent of all licensees), 6221 On-premises licensees (36 per cent), 1199 Restricted Club licensees (7 per cent) and 783 Full Club licensees (4 per cent). The total number of licensees at February 2009 was 18,169.

Analysis of the data suggests that the majority of the offences occur in or near premises that hold an On-premises Licence or a General Licence, as shown in Figure 4.4. For example, 20 per cent of General licensees were associated with one to two offences, 21 per cent were associated with three or more offences and the remainder (59 per cent) were not associated with any offences. Whereas only 1 per cent of Restricted Club licensees were associated with one to two offences and the remainder (99 per cent) were not associated with any offences.

The results of this analysis must be interpreted carefully. The results do not suggest that the alcohol-related harm associated with packaged liquor licensees is low; rather, that the alcohol-related harm that occurs in or near premises with a Packaged Liquor licence is low. The actual harm may occur some distance away from these premises and is not able to be linked back to the licensee using currently available data.

Figure 4.4

PROPORTION OF LICENSEES ASSOCIATED WITH OFFENCES BY LICENCE TYPE



Offences by region

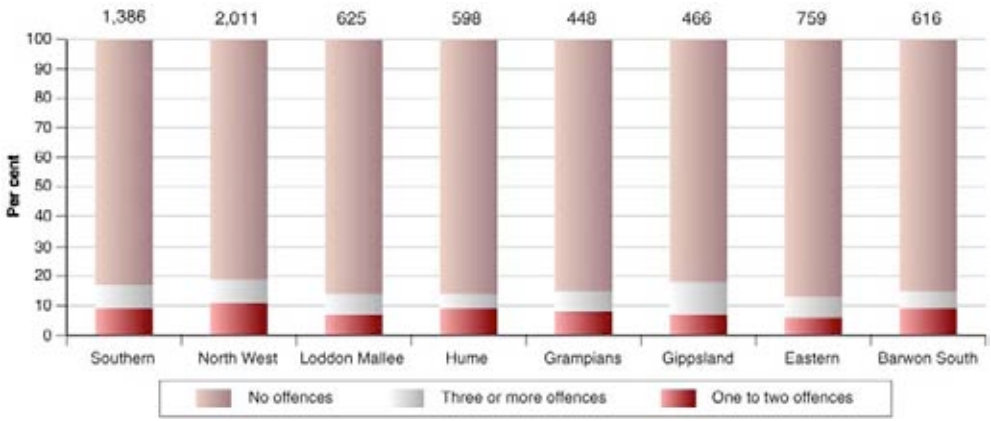
This analysis was based on the Department of Justice regions.[7] The largest proportion of licensees (29 per cent) are located in the North West metropolitan region, followed by the Southern metropolitan (20 per cent), Eastern metropolitan (11 per cent), Loddon Mallee, Barwon South, Hume (each 9 per cent), Gippsland (7 per cent) and Grampians (6 per cent) regions. This is depicted graphically in Figure D.5 in Appendix D.

Analysis of the data suggests that the proportion of licensees associated with one or more offences does not differ widely between regions, as shown in Figure 4.5. The proportion of licensees in each region that have been associated with at least one offence in the last three years ranges from 19 per cent for the North West region to 13 per cent for the Eastern region. This result is consistent with the results of the regression analysis (see Section 4.4), which found no evidence of a correlation between region and the rate of offences at venues.

[7] A map of the Department of Justice regions can be found on the Department 's website.

Figure 4.5

PROPORTION OF LICENSEES ASSOCIATED WITH OFFENCES BY REGION



Venue capacity

It is important to note that venue capacity (patron numbers) was included in this analysis mainly as a control for venue size. That is, venues with larger capacity tend to be associated with more offences, as they are larger in size and attract more people. This was not intended as a proxy for overcrowding (one of the key risk factors identified in the literature review), as venue size and venue overcrowding are two distinct concepts. As discussed above, the data does not contain any venue-specific information to indicate overcrowding, so this risk factor was not tested in this analysis.

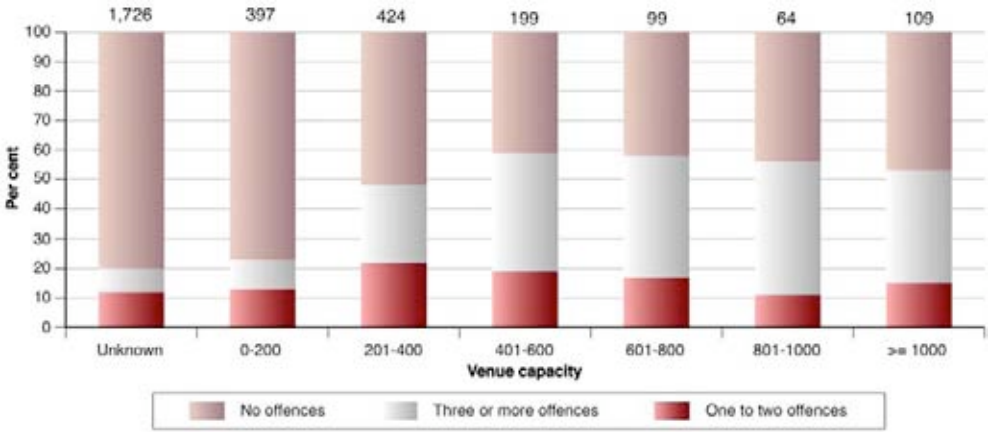
Data on venue capacity was only available in detail for General and On-premises Licensees (see Figure D.3 in Appendix D for a break up General and On-premises licensees by venue capacity). In addition, venue capacity data was only available for 43 per cent of General and On-premises licensees.

As expected, basic analysis of the data for General and On-premises licensees suggests a positive relationship between venue capacity and offences in or near licensed premises, as shown in Figure 4.6. In particular, venues with capacity greater than 400 tend towards being associated with three or more offences. However, given that venue capacity information was not available for a significant proportion (57 per cent) of the licensees included in this analysis, no firm conclusions can be drawn regarding the relationship between venue capacity and offences in or near licensed premises.

The proportion of licensees in each group that have been associated with at least one offence in the last three years ranges from 59 per cent for venues of 401–600 capacity to 20 per cent for the group of venues where capacity is unknown and assumed to be low.

Figure 4.6

PROPORTION OF GENERAL AND ON-PREMISES LICENSEES ASSOCIATED WITH OFFENCES BY VENUE CAPACITY



4.4 Regression analysis

This section outlines in more detail the methodology and results for the regression modelling. A technical treatment of the methodology and results is provided in Appendix C. As discussed above, it was necessary to conduct a regression analysis to validate the results of the basic statistical analysis, previously discussed in this chapter, and to allow for firm conclusions to be drawn from the data. In particular, regression analysis is more robust than basic statistical analysis as it tests the simultaneous relationship between a number of variables and the variable of interest, thus isolating the impact of changes in one variable while controlling for simultaneous changes in other variables.

The methodology, variables included, results and implications of the analysis are discussed below.

Methodology

Regression analysis is a statistical technique which can assess the relationship between an *explanatory variable* (in this case, a proxy for alcohol-related harm) and a number of *predictor variables* (e.g. venue risk factors) that can theoretically be regarded as impacting on the explanatory variable.

A large number of different regression modelling techniques exist and the choice of appropriate technique depends on the nature of the data employed for the analysis, i.e. time-series versus cross sectional, or continuous versus categorical.

In this case, the data supplied by the Department of Justice represents a cross-section of Victorian liquor licensees for the year 2008. In addition, the explanatory variable (discussed below) is a count variable, i.e. it represents a count of the number of offences each licensee was associated with over the period 2006-08. Therefore, the regression technique adopted in the analysis was selected from a set of techniques designed for cross-sectional count data, where the optimal model was chosen based on a series of hypothesis tests for model selection.

Once the optimal model was chosen, and run through statistical software, further analysis was undertaken on the results to inform conclusions regarding the risk factors. Hypothesis tests were conducted to determine whether the relationship between each of the risk factors and the proxy for alcohol-related harm was statistically significant. In addition, marginal effects and model predictions were calculated to determine risk relativities between the different risk factors, degrees exhibited of the risk factors and combinations of the risk factors. The results of this analysis helped inform the design of the risk based licensing models outlined in Chapter 5.

Data and variables included in the model

The regression analysis was based on data for 3,018 General and On-premises licensees taken from the data set. It is understood that this data represents the entire population of General and On-premises licensees throughout Victoria, aside from a large group of restaurants that were excluded from the data set provided by the Department of Justice.

The regression analysis did not include Full Club, Restricted Club or Packaged Liquor licensees as information for the predictor variables was mostly not available for these licence types. The exclusion of these licence types was not regarded as a concern as the majority of licensees with offences were either General or On-premises Licensees.

The explanatory variable in the regression model represents the number of offences (assault, robbery against a person and property damage) in or near licensed premises over the period 2006-08. This is used as a proxy for alcohol-related harm in or near licensed premises. It was chosen as it represents the only indicator of venue-related incidents for which data are currently available. Given the type of regression model used for the analysis, the results of the model represent the relationship between the predictor variables (risk factors) and the rate of offences in or near licensed premises over a three-year period.[8]

The predictor variables covered risk factors as well as a number of additional variables that improve the specification of the regression equation:

- *Risk factors*:
  - *venue type*: hotel gaming, adult entertainment, licensees with restaurant conditions, and venues offering live and recorded music;
  - *opening hours*: closing time on Wednesday-Friday and Saturday nights; and
  - *patron intoxication*: proxied by the number of infringements served to venues for serving and/or permitting entry to an intoxicated person over the past three years.
- *Additional variables:*
  - *venue capacity*: which captures the number of patrons the venue is licensed to hold (both indoor and outdoor); and

[8] The offences data used for the analysis represents the number of offences in or near each venue over the three-year period 2006 to 2008. Applying data from this broader time period (i.e. versus data for 2008 only) increased the number licensed premises that were associated with an offence, and thus, the explanatory power of the model.

– *venue region*: the location of the venue by Department of Justice region. [9]

The additional variables were included in the model to control for other factors that might be related to offences in or near licensed premises. It is important to include such control variables, where possible, as failure to include them can result in biased estimates, i.e. the relative degree of risk posed by a risk factor could be over- or under-estimated.

The predictor variables were included in the model as sets of categorical dummy variables. The dummy variable categories and number of observations relevant to each are summarised in Table 4.2. Note that the reference categories for the sets of dummy variables are indicated in *italics.* These reference categories should be held front of mind when interpreting the results outlined below.

[9] A map of the Department of Justice regions can be found on the Department 's website.

Table 4.2

SUMMARY OF PREDICTOR VARIABLES INCLUDED IN REGRESSION ANALYSIS*

Predictor variable	Dummy variable category	Total observations
Infringements	*Has not had an infringement*	*2,697*
	Has had at least one infringement	321
Venue type (based on activities authorised under licence)	*Unknown*	*2,107*
	Restaurant	152
	Adult entertainment	33
	Live and/or recorded music	462
	Gaming	264
Venue late opening hours (latest closing time on any night of the week)	*1:00am or earlier, or unknown*	*1,941*
	1:01-3:00am	603
	3:01-5:00:00am	173
	5:01-7:00:00am	133
	24 hours	168
Venue capacity	*0-100 or unknown*	*1,863*
	101-200	260
	201-400	424
	401-600	199
	601-800	99
	801-1000	64
	1000 and up	109
Region	*Southern*	*562*
	North West	1,097
	Eastern	206
	Hume	277
	Grampians	202
	Gippsland	171
	Loddon Mallee	262
	Barwon South	241

*Reference categories for the sets of dummy variables are indicated in *italics*.

It is important to note that the data set does not contain any information that could be used to directly capture venue overcrowding or venue management practices — factors identified in the literature review as important risk factors. As such, the strength of the relationship between these two venue risk factors and venue-specific alcohol-related harm cannot be tested in this analysis. To some degree, venue management practices may be reflected in the number of infringements received for patron intoxication. Therefore, conclusions regarding this risk factor can, to a certain degree, help to draw conclusions about the importance of staff and management practices.

Key modelling results

The results from the regression analysis indicate that at least one category out of each of the predictor variables are statistically significant – many at a high level of significance. This provides evidence to suggest that all three venue risk factors captured by the models (i.e. venue type, venue late opening hours and venue infringements) are positively correlated with offences in or near licensed premises.

Note that the results for the region control variable are not provided in this report as region was found to be insignificant and, therefore, not included in the final model. Note also that venue capacity was included as a control variable in the final model. However, the results for venue capacity are not provided in this report as no firm conclusions could be drawn regarding the relationship between venue capacity and offences in or near licensed premises given the missing venue capacity a data.

This section summarises the overall regression results and provides an explanation of the results for each risk factor.

Overall results

Table 4.3 contains regression coefficients and marginal effects for each variable included in the model.[10] More details on the regression results, such as standard errors and significance levels, are provided in Appendix C.

The marginal effects predict the impact of a variable category on the rate of offences in or near licensed premises relative to the reference category (see Table 4.2), all other variables held constant. The marginal effects are expressed as a factor change in the rate of offences in or near licensed premises.[11]

For example, the factor change estimate for licensed premises open 24 hours is two. This estimate therefore suggests that the expected rate of offences in or near licensed premises open 24 hours is double (or two times) the expected rate of offences in or near licensed premises closing at 1am or earlier (the reference category).

Expressed differently, if two licensees that were similar in every way — except that one closed at 1am and the other was open 24 hours — were to be compared, the regression model would predict that the rate of offences in or near the venue open 24 hours would be double the rate of offences in or near the venue closing at 1pm. So if it was known that the venue closing at 1am was associated with 3 offences over the last year, the model would predict that the venue open 24 hours would be associated with 6 offences in the same year, i.e. two times three equals six.

There are three important considerations when interpreting these results:

- *the size of the marginal effect* — the larger the number the larger the predicted impact on the rate of offences;

[10] Note that coefficients for Zero-inflated Negative Binomial Models are not interpreted in the same way as Ordinary Least Squares models. Rather, the exponential of the coefficient (i.e. EXP(coeff.)) converts the coefficient into a result that is more meaningful. For the purposes of this report, the exponential of the coefficient is referred to as the marginal effect.

[11] A factor is one of two or more numbers that, when multiplied together, produce a given product (i.e. for the calculation 2 x 3 = 6, both two and three are the factors). Note that the rate of offences represents the rate over a three-year period (see the above footnote for further explanation).

- *the sign of the coefficient* — a positive sign indicates a positive correlation between the predictor variable (or risk factor) and the rate of offences in or near licensed premises and a negative sign indicates a negative correlation; and
- *the statistical significance of the coefficient* — indicates whether there is evidence of a statistically significant correlation between the predictor variable and the rate of offences in or near licensed premises (variables that are not statistically significant are indicated so in Table 4.3).

Table 4.3

REGRESSION RESULTS: COEFFICIANTS AND MARGINAL EFFECTS

Variable	Dummy variable categories	Coefficient	Marginal effect*
Constant	N/A	0.248	
Venue infringements	At least one infringement	0.488	1.6
Venue type	Live and recorded	0.537	1.7
	Gaming	0.490	1.6
	Licensees with restaurant conditions	-1.464	0.2
	Adult entertainment	-0.284	Insignificant
Venue closing time	1:01-3:00AM	0.291	1.3
	3:01-5:00AM	0.630	1.9
	5:01-7:00AM	0.316	1.4
	24 hours	0.681	2

Source: Allen Consulting Group analysis.
* The marginal effects predict the impact of a variable category on the rate of offences in or near licensed premises relative to the reference category (see Table 4.2), all other variables held constant. The marginal effects are expressed as a factor change in the rate of offences in or near licensed premises. Variable coefficients that are insignificant are indicated in the table.

Results for each risk factor

The key results for each risk factor are discussed below.

Patron intoxication

The results suggest a positive correlation between venue infringements for patron intoxication and the rate of offences in or near licensed premises. The marginal effect for venue infringements suggests that the expected rate of offences in or near licensed premises that have had one or more infringements is 1.6 times the expected rate of offences in or near licensed premises that have had no infringements.

Further analysis of the data suggests that the relationship between infringements and offences is linear and increasing depending on the number of infringements received by a venue.[12]

Venue type

[12] A separate model was run which included the number of infringements as a continuous variable, rather than a dummy variable. The estimated coefficient for this variable was 0.225 and was statistically significant.

The results for venue type differ according to the different venue types. Venues offering live and recorded entertainment and hotel gaming facilities are positively correlated with the rate of offences in or near licensed premises. Licensees with restaurant conditions are negatively correlated with the rate of offences in or near licensed premises. The results for licensed premises offering adult entertainment are insignificant, suggesting no correlation between these venues and the rate of offences in or near licensed premises.

In relation to the results for venues offering hotel gaming facilities, it is not possible to determine exactly what is driving the higher rates of offences at such venues. This may be due to some other factor that is common to gaming venues (aside from late opening hours, venue capacity or infringements for intoxication), rather than the existence of gaming facilities. Whist the causality of a link between gaming facilities and higher rates of offences is not established, the results do suggest a strong correlation for venues offering hotel gaming facilities.

The marginal effects for venue type suggest, for example, that the expected rate of offences in or near venues offering hotel gaming facilities is 1.6 times the expected rate of offences in or near the licensees in the reference group (where these licensees are assumed to represent the average level of risk among General or On-premise licensees). Note that, due to missing data, it is not possible to determine the nature of the venues in the reference group, other than to say that it does not include any hotel gaming venues.

Note that the findings for licensees with live and recorded entertainment should be interpreted with a high degree of caution. It is understood that the unknown group of venues, which includes 2,094 licensed premises, most likely includes many venues with live and/or recorded entertainment. Therefore, as the unknown group of venues is treated as the reference group (which is a necessary approach under the analysis), there is a high risk that the model is comparing like with like in terms of this venue type. The effect of this is that the coefficient and marginal effect estimates for this variable may be biased.

In particular, live and recorded entertainment represents 462 licensed premises in the data set. However, it is understood that there are far more venues across Victoria that have live and/or recorded entertainment. Therefore, the unknown group of venues must contain many venues that have live and/or recorded entertainment. The effect of this is that the coefficient and marginal effect estimates for live and recorded entertainment may be upward biased.[13] Given the risk of upward bias, an analysis of relative risk between live and recorded entertainment and other risk factors cannot be conducted with a high degree of confidence in the results.

Given the data limitations, the risk associated with live and recorded entertainment is assumed to be captured by the late opening hours risk factor for the remainder of this analysis. This is reasonable given that that most (89 per cent) live and recorded entertainment venues identified in the data set trade after 1am, and the degree of confidence in the data for late opening hours is far higher (i.e. late trading information is only missing for 2 per cent of licensed premises in the analysis).

[13] The bias is likely to be upward as the basic data analysis suggests that the proportion of venues associated with an offence was, on average, lower (21 per cent) for the unknown group of venues relative to the group of live and recorded music venues (55 per cent).

In relation to hotel gaming and adult entertainment, it is understood that most of these venues are adequately captured by the relevant licence type categories. The implication of this is that there are few, or none, of these venues in the unknown group (or reference category). In relation to restaurants, many are not included in the data set (as discussed above), but the ones that are included are mostly captured by the 'licensees with restaurant conditions' category. Given that all of these venue types (hotel gaming, adult entertainment, and restaurants) are generally not in the unknown group, the coefficient and marginal effect estimates for these variables are regarded as robust enough to draw conclusions from. In particular, it is for this reason that gaming is included in the additional analysis outlined below.

Late opening hours

The results suggest a positive correlation between late opening hours and the rate of offences in or near licensed premises. The marginal effects for opening hours suggest that, for example:

- the expected rate of offences in or near licensed premises closing between 1:01 and 3:00am is 1.3 times the expected rate of offences in or near licensed premises closing at 1:00am or earlier; and
- the expected rate of offences in or near licensed premises closing between 3:01 and 5:00am is 1.9 times (i.e. almost double) the expected rate of offences in or near licensed premises closing at 1:00am or earlier.

The marginal effects for the other two categories of closing time suggest that the rate of offences subsides for venues closing between 5:01 and 7:00am and then jumps back up again for venues open 24 hours. Note that, given the available data, it is not possible to determine why the rate of offences subsides for venues closing between 5:01 and 7:00am.

Interpreting these results in a general sense, it could be said that, relative to venues closing at 1:00am or earlier, the rate of offences increases for venues closing between 1:01 and 3:00am and increases again for venues closing between 3:01 and 5:00am. For venues open after that point, the rate of offences flattens out.

The group of venues who close between 11:01pm and 1:00am could not be included in the model due to limited data for the 11:00pm closing time. However the basic data analysis suggests that, relative to venues that close at 11:00pm, the level of risk increases for venues that close between 11:01pm and 1:00am, but this level of risk is less than those venues that close after 1:00am.

Results of additional analysis

The above analysis outlines the results of the core regression model. However, a number of other models were run, and calculations undertaken, to determine relative levels of risk between different types, levels and combinations of risk factors. The approach and results of this additional analysis are outlined below.

Risk factor combinations

The results outlined above suggest that three risk factors included in the analysis are correlated with the rate of offences in or near licensed premises. The results for the marginal effects also provide an indication of magnitude of the impact of each risk factor on the rate of offences. The next step is to determine whether the impact of the risk factors increases for venues exhibiting combinations of the risk factors.

Analysis was conducted involving a number of different model runs, each with a different combination of the variables for hotel gaming, closes after 1am and one or more infringements. These combinations were included in the models (in addition to the other predictor variables) through the use of interaction terms. Pairs and triples of variables were multiplied together and included in the models to represent licensed premises exhibiting combinations of risk factors.

When using interaction terms, the correct approach is to include in the models the variables on their own as well as the variables multiplied together (i.e. the interaction term) (Berndt 1996, p.165). If the interaction term is statistically significant, this suggests that the impact of the risk factors in combination is greater than the impact of the risk factors in isolation. If the interaction term is statistically significant, but the variable(s) on their own are statistically insignificant, this suggests that the combination of variables is what is driving the impact, not the variables on their own.

The key results of the interaction term analysis are provided in Table 4.4.

Table 4.4

REGRESSION RESULTS: RISK FACTOR COMBINATIONS (INTERACTION TERMS)

Variable	Coefficient	Statistical significance
Infringements and late closing		
One or more infringements	0.283	Significant
Closes after 1:00am	0.248	Significant
One or more infringements & closes after 1:00am	0.324	Significant
Hotel gaming and late closing		
Hotel gaming	0.822	Significant
Closes after 1:00am	0.388	Significant
Hotel gaming & closes after 1:00am	-0.283	Insignificant

Source: Allen Consulting Group analysis.

The interpretation of these results is discussed below for each risk factor combination.

Infringements and late closing

The interaction term representing licensed premises that close after 1am and that have also received one or more infringements is statistically significant. In addition, the variables on their own are also statistically significant. This suggests the following:

- for licensed premises that close before 1am, those that have had one or more infringements are likely to be associated with *higher* rates of offences relative to those that have not had any infringements;
- for licensed premises that have not had any infringements, those that close after 1am are likely to be associated with *higher* rates of offences relative to those that close before 1am; and
- licensed premises that close after 1am and have also had one or more infringements are likely to be associated with *higher* rates of offences relative to premises that only exhibit one of these two risk factors.

These results suggest that the impact of the risk factors for infringements and late closing on the rate of offences in or near licensed premises is *magnified* when these two risk factors are combined.

Hotel gaming and late closing

The interaction term representing licensed premises with hotel gaming facilities that close after 1am is not statistically significant. However, the variables on their own are statistically significant. This suggests the following:

- for licensed premises that close before 1am, those that have hotel gaming facilities are likely to be associated with *higher* rates of offences relative to those that don't have hotel gaming facilities;
- for licensed premises that don't have gaming facilities, those that close after 1am are likely to be associated with *higher* rates of offences relative to those that close before 1am; and
- licensed premises with hotel gaming facilities that close after 1am are likely to be associated with the *same* rates of offences relative to premises that only exhibit one of these two risk factors.

These results suggest that the impact of the risk factors for hotel gaming and late closing on the rate of offences in or near licensed premises *is not magnified* when these two risk factors are combined. In other words, the level of risk associated with hotel gaming is the same, regardless of closing time.

Other combinations

In relation to the analysis involving other combinations, of particular note was the finding that the interaction term representing hotel gaming with infringements was not statistically insignificant. This suggests that the impact of the risk factor for gaming might not be magnified by the risk factor for patron intoxication (infringements).

However, it is important to note that this finding is based on a relatively small sub-sample of 49 licensees. This small sub-sample size, relative to the overall size of the data set, may be what is driving the statistical insignificance for this combination (i.e. an issue of small 'cell size'). In other words, this combination may be a level of granularity that is too fine for this model to handle with a reasonable degree of confidence. Therefore, the result for the combination of hotel gaming with infringements should be interpreted with caution.

Relative degrees of risk within and between different risk factors

The final step in the analysis is to determine the relative degrees of risk between the different risk factors and risk factor combinations, as well as the relative degrees of risk within the risk factors.

Analysis was conducted involving additional model runs as well as the calculation of predicted rates of offences for licensees under different risk factor scenarios. Predicted rates of offences were calculated from the regression results by summing the relevant regression coefficients (including the constant) and taking the exponential of the resulting value.[14] All other variable in the model were held constant for this analysis. Unless otherwise stated, the sum of the coefficients is based on the relevant coefficient estimates provided in Table 4.3.

The results predict the rate of offences over a three year period for premises exhibiting different risk factor scenarios. Based on these results, different risk factor scenarios were then categorised as medium, high or very high risk, based on the predicted rate of offences. The results of this analysis are provided in Table 4.5.

Note that values for the predicted rates of offences over a three year period are smaller than the actual rates likely experienced in reality. This is because data on the number of offences used for the analysis only captures a small proportion of actual offences that occur in, or around, licences premises (discussed in more detail below). What is important here are the relativities between the values for the predicted rates of offences.

Table 4.5

PREDICTED RATES OF OFFENCES FOR LICENCED PREMISES WITH RISK FACTORS

Scenarios for different licensed premises	Sum of relevant coefficients	Predicted rate of offences*
Low risk licensed premises		
Licensed premise with none of the above risk factors	0.248	1.3
Medium risk licensed premises		
Licensed premise that closes between 1:01 and 3:00am	0.539	1.7
Licensed premise with two infringements	0.698^	2.0
Licensed premise with hotel gaming facilities	0.738	2.1
High risk licensed premises		
Licensed premise that closes between 3:01 and 5:00am	0.878	2.4
Licensed premise with three infringements	0.923	2.5
Very high risk licensed premises		
Licensed premise that closes after 1am and has also had one or more infringements	1.146#	3.1

Source: Allen Consulting Group analysis.
*Represents the predicted rate of offences over a three-year period. This was calculated from the regression results by summing the relevant regression coefficients (including the constant) and taking the exponential of the resulting value. All other variables in the model were held constant across the scenarios.
^A separate model was run which included the number of infringements as a continuous variable, rather than a dummy variable. The estimated coefficient for this variable was 0.225 and was statistically significant.

[14] This is the correct approach for predicting outcomes (rates of offences) for licensed premises with different risk factors given the regression technique used for the analysis (i.e. the zero-inflated negative binomial model) (Jones et al. 2007 p.283).

#Value is based on the sum of the relevant coefficients provided in Table 4.4 and a coefficient for the constant of 0.290, consistent with the approach used by Berndt (1996, p.165).

These results indicate the following in terms of relative risk.

Licensed premises that do not exhibit any of the above risk factors will, on average, be associated with 1.3 offences every three years. Licensed premises in this category are classed as low risk. Note that, due to the nature of the regression technique used and the fact that it was based on data for General and On-premises licensees only, the predicted rate of offences for this group does not represent the predicted rate of offences for the average Victorian licensed premise that does not exhibit any risk factors. For such a group, the actual rate of offences every three years is likely to be close to zero.

Licensed premises that close between 1:01 and 3:00am, have two infringements or have hotel gaming facilities will, on average, be associated with 1.7 to 2.1 offences every three years. Licensed premises in this category are classed as medium risk.

Licensed premises that close between 3:01 and 5:00am or that have had three infringements will, on average, be associated with 2.4 to 2.5 offences every three years. Licensed premises in this category are classed as high risk. Note that, for licensed premises that close after 5am, the regression results suggest that the level of risk subsides slightly and then increases again for premises open 24 hours. For licensed premises with more than three infringements, the regression results suggest that the level of risk is linear and increasing. However, for the sake of simplicity, all licensees that close after 3am or that have had more than two infringements are classed as high risk.

Licensed premises that close after 1am and have also received one or more infringements will, on average, be associated with 3.1 offences every three years. Licensed premises with this combination of risk factors are classed as very high risk. Note that this represents the average for licensed premises that close late or have had infringements. The rate of offences for premises that close very late and that have also had many infringements is likely to be much higher than this.

4.5 Implications for the design of a risk-based licensing model

The results of the regression analysis suggest that the following risk factors are correlated with the proxy for alcohol-related harm:

- late opening hours;
- patron intoxication;
- hotel gaming; and
- combination of late opening hours with patron intoxication.

The results also suggest that the level of risk associated with hotel gaming is the same, regardless of closing time.

The results of the basic data analysis indicate that:

- The proportion of licensees associated with at least one offence in the last three years was 32 per cent for clubs with gaming facilities versus 3 per cent for clubs without gaming facilities. The proportion of hotel gaming licensees (captured in the regression) that were associated with at least one offence in the last three years was 70 per cent.
- The proportion of licensees associated with at least one offence in the last three years was 21 per cent for licensed premises that close between 11:01pm and 1:00am versus 9 per cent for licensed premises that close at 11pm. The proportion of licensees that close between 1:01 and 3:00am (captured in the regression) that were associated with at least one offence in the last three years was 42 per cent.

These results suggest that licensed premises with club gaming facilities, or that close between 11:01 and 1:00am, also pose a level of risk that is greater than that posed by premises closing at 11pm or that don't have club gaming facilities. However, this level of risk is lower than the level of risk posed by hotel gaming or premises that close after 1am.

The results of the regression analysis also indicate different levels of relative risk between different types, levels and combinations of risk factors. Based on these results, and the findings of the basic statistical analysis, the relative levels of risk for different types, levels and combinations of risk factors are summarised in Table 4.6 (note that, relative to Table 4.5, this table includes an additional low-medium risk group). These risk relativities suggest levels of fees that could be charged to licensed premises under a risk based licensing system.

Table 4.6

SUMMARY OF RISK RELATIVITES

Risk relativities
Low risk
Licensed premises with none of the specified risk factors
Low-medium risk
Licensed premises with club gaming facilities
Licensed premises that close between 11:01pm and 1:00am
Medium risk
Licensed premises that close between 1:01 and 3:00am
Licensed premises with one to two infringements
Licensed premises with hotel gaming facilities
High risk
Licensed premises that close after 3am (not including premises with hotel gaming)
Licensed premise with three or more infringements
Very high risk
Licensed premises that close after 1am and that also have one or more infringements

Source: Allen Consulting Group analysis.

The above discussion outlines the key results of relevance to the design of a risk based licensing model. In particular, it provides evidence to suggest that licensees exhibiting the risk factors for patron intoxication, hotel gaming and opening hours are likely to be associated with higher rates of offences relative to other licensees. In addition, it provides an evidence base to inform decisions regarding how to weight different types, levels and combinations of risk factors.

4.6 Strengths and limitations of the data analysis

In using this analysis to help inform a risk based licensing model, there are a number of strengths and limitations of the analysis as outlined below.

- Data on the number of offences only capture a small proportion of actual incidents that occur in, or around, licences premises. This is because some incidents might not be recorded and many others might not involve attendance by police. In addition, only 55 to 57 per cent of the offences data could easily be linked to specific venues due to address data that was missing, incorrect or incomplete. The implication of this for the regression results is that the rates of offences predicted by the model are likely underestimate the rate of incidents that might occur in reality.
- For similar reasons as outlined above, data on the number of infringements only capture a certain proportion of breaches of law by licensed premises regarding patron intoxication.
- The offences data recorded by Victorian Police provide detail on the number of offences over the last ten years that could be linked to a specific venue. However, it is not clear what proportion of these offences is caused by alcohol-related harm. While this may be a limitation of the data set, the fact that the offence is linked to a licence venue increases the probability that alcohol is a factor in the associated harm.
- Data on ambulance call-outs to licensed premises was regarded as an alternative proxy for alcohol-related harm. However, this was not included in the analysis as such data was not available.
- Data is incomplete in some areas, particularly venue type and venue capacity. In relation to venue capacity, the implication of the missing data is that the nature of the relationship between venue capacity and offences in or near licensed premises cannot be determined through the analysis. In relation to venue type, the implication is that some high risk venue types (i.e. those not explicitly captured by the venue type variable, such as nightclubs or pubs) may not have been identified as being high risk through the analysis. In addition, the findings for live and recorded music should be interpreted with caution (discussed in more detail above). The findings regarding hotel gaming are regarded as reasonably robust given that most hotel gaming venues are identified in the data (and therefore by the hotel gaming category under the venue type variable) and the findings are supported by the results of the basic statistical analysis which finds that 70 per cent of licensed premises with hotel gaming were associated with one or more offences.

- No data is available for two of the key risk factors — overcrowding and staff and management practices — thus these could not be tested in this analysis (although the results for patron intoxication provide some indication of the importance of staff and management practices).
- The regression analysis was based only on General and On-premise licensees as data for all three risk factors together were only available for these licence types (some conclusions for the other license types are drawn based on the basic data analysis).

While there are some limitations concerning the overall veracity of the data, the results nevertheless suggest that the models are well specified and the risk factors associated with patron intoxication, venue opening hours and gaming are positively correlated with the proxy for alcohol-related harm. This provides a sound evidence base for the design of a risk-based licensing system — noting the majority of the empirical findings are also supported by the findings of the literature review.

Chapter 5

Risk-based licensing models

This chapter considers a number of design features of risk-based models for recovering costs to the Victorian Government associated with regulating licensees. Design aspects are based on results of the data analysis in the previous chapter, and consideration of a number of other approaches in other jurisdictions and contexts.

5.1 Introduction

This chapter considers a number of risk-based models for recovering costs to the Victorian Government associated with regulating licensees.[15]

These models have been developed based on the results of the data analysis outlined in Chapter 4 and consideration of a number of other approaches, specifically: Queensland's risk-based liquor licensing fees; Ontario's risk-based liquor licensing regime; Greater Geelong's late licensees land rate differential (the 'vomit tax'); and WorkCover Victoria's risk-based premium model, see Table 5.1 for a summary, or for more detailed information.

Table 5.1

APPROACHES IN OTHER JURISDICTIONS

Approach	Risk factors	Assessment
Queensland liquor licensing fees	Licence type Trading hours Food Compliance history	Self assessment
Ontario liquor licensing	Licensee risks: • Past conduct • Liquor related infractions • Honest and integrity • Financial responsibility • Training and experience Premises risks: • type • location • occupancy • activities • hours of operation	Assessed independently
Greater Geelong land rate	Trading hours	Assessed independently
WorkCover premiums	Remuneration Industry Claims experience	Combination of self assessment and independent assessment

[15] These have been developed in the context of advice that the models should be based on fees set by risk rather than by regulatory effort.

Typically, fees are linked to the associated level of regulatory effort. In this case however, the fees are to be set and applied based on the risk of alcohol-related harm. The ultimate objective is to encourage licensees to modify their behaviour by:

- apportioning fees on the basis of risk, recognising that risk varies across licensees; and
- providing incentives for venues to modify their behaviour.

The scheme should also be administratively efficient, from the perspective of both the regulator and the licensee.

Chapter 3 found that, based on a review of the available international literature, the following characteristics and practices of licensees (or risk factors) are strongly associated with alcohol-related harm:

- venue type;
- opening hours;
- patron intoxication;
- crowding; and
- staff and management practices.

Chapter 4 tested whether these risk factors are relevant in the Victorian context. More specifically, it outlines a statistical analysis of data for 6915 Victorian premises with a liquor licence. The analysis suggests that the first three licensed venue risk factors listed above (venue type (gaming only), opening hours and patron intoxication) are all positively correlated with the proxy for alcohol-related harm (offences in or near licensed premises). In relation to the latter two (crowding and staffing and management practices), it was not possible to draw any conclusions regarding these risk factors due to a lack of data in these areas.

A high level depiction of the areas covered by, and results of, the data analysis is outlined in Figure 5.1. The first three columns represent risk factors covered by the data analysis. The shaded areas containing the letter 'H' indicate areas where the data analysis identified a level of risk of alcohol-related harm based on the regression analysis. The shaded areas containing the letter 'M' indicate areas where the data analysis identified a level of risk of alcohol-related harm based on the basic data analysis, i.e. where the robustness of the result is lower due to the form of analysis. N/A indicates that the risk factor is not relevant to that licence type and the question marks indicate areas where data was not available with which to draw any conclusions.

Figure 5.1

SUMMARY OF RESULTS AND AREAS COVERED BY THE DATA ANLYSIS

	Intoxication	Late opening	Gaming	Crowding	Management practices
Packaged liquor	M	?	N/A	?	?
Restricted club	M	N/A	N/A	?	?
Full club	M	?	M	?	?
On-premises	H	H	N/A	?	?
General	H	H	H	?	?

Source: ACG analysis.

The risk factors for opening hours and patron intoxication identified in the data analysis are consistent with those found in other jurisdictions. For example, liquor licensing in Queensland and Ontario recognise the increased risk associated with venue type, opening hours and compliance history. Greater Geelong's late licensees land rate differential has venue opening hours as its sole risk factor.[16]

In relation to gaming, there does not appear to be a precedent where a jurisdiction has focussed on gaming as a risk factor. However, given that the data analysis suggests strong evidence of a relationship between gaming and offences in or near licensed premises, gaming is regarded as a risk factor that should be included in a risk based licensing model.

Given the lack of data available to test the significance of the risk factors for crowding and staffing and management practices, these are not included in the models outlined in this chapter. This does not suggest, however, that these two risk factors should not be considered as part of a risk based licensing model in Victoria.

The following sections consider different ways of: applying the identified risk factors (type of venue, opening hours, intoxication); determining the appropriate fee; framing the fees; and accounting for large fees or large variations in fees.

5.2 Applying the risk factors

This section discusses implications of the data analysis for the design of a risk based licensing model. In addition, the experience of another jurisdiction that has implemented risk based licensing fees (Queensland) is also discussed, where relevant. The experience of Queensland is included to provide a perspective on the data analysis results, although the extent of the evidence base upon which aspects of the Queensland system is founded may be limited. This is particularly important given the limitations of the data analysis, as outlined in Section 4.6.

[16] Other jurisdictions also recognise additional risk factors. Queensland recognises the provision of food, and Ontario recognises financial responsibility, honesty and integrity, training and experience, activities, occupancy, and location.

Determining the broad fee levels

As discussed in the previous chapter, the results of the regression analysis imply different levels of relative risk between different types, levels and combinations of risk factors. The relevant findings are reproduced in Table 5.2. These risk relativities imply different fee weightings that could be applied depending on the different types, levels and combinations of risk factors exhibited by licensed premises. The outcome would be that higher risk premises would be charged a higher fee.

Table 5.2

SUMMARY OF RISK RELATIVITES

Risk relativities
Low risk
Licensed premises with none of the specified risk factors
Low-medium risk
Licensed premises with club gaming facilities
Licensed premises that close between 11:01pm and 1:00am
Medium risk
Licensed premises that close between 1:01 and 3:00am
Licensed premises with one to two infringements
Licensed premises with hotel gaming facilities
High risk
Licensed premises that close after 3am (not including premises with hotel gaming)
Licensed premise with three or more infringements
Very high risk
Licensed premises that close after 1am and that also have one or more infringements

Source: Allen Consulting Group analysis.

Across licensees as a group (based on the sample of 6,915 licensees used for the analysis), only a moderate proportion exhibit the risk factors identified through the analysis, as follows:

- 29 per cent trade late (this includes all Full Club licensees, as their licence conditions permit them to serve alcohol 24 hours);
- 0.4 per cent have gaming facilities (Gaming is mostly represented in the combination group below);
- 2 per cent have received infringements for patron intoxication; and
- 9 per cent have some combination of the above (gaming is mostly represented in this group).

The results of the data analysis are broadly consistent with the system in Queensland, where the maximum fees (and, by implication, risk) for trading hours and compliance history are broadly similar, whereas gaming venues are not designated as an explicit risk factor.

Measurement errors

Whereas venue type and opening hours are linked to the characteristics of the licensee, infringements reflect the behaviour of that licensee. However, this measure is also potentially highly imperfect and subject to measurement error. In particular, in the absence of a consistent, risk-based enforcement policy:

- some higher risk licensees may not receive a corresponding number of infringements for intoxication;
- some lower risk licensees may receive an undue number of infringements; and
- there may be greater random variability in infringements.

To the extent that these errors are present, this would distort the relevant fee and therefore the incentive to change behaviour. The discussion below uses intoxication infringements as a risk factor on the basis that a consistent, risk-based policy for enforcement is in place.[17] Otherwise, the other two risk factors should be used.

Those charged a fee

The risk factors provide a way of identifying those licensees with a higher risk profile than others, and therefore, those that should pay a higher proportion of fees.

Based on the analysis, the licensees potentially associated with one or more of the risk factors are:

- full club licensees (that have gaming facilities);
- on premises and general licensees (that trade over extended hours or have gaming facilities); and
- any licensee that has received infringements for intoxication.

Impact on behaviour

The sensitivity of licensees to different levels of fees is unknown. It may be that even a highly tailored risk-based approach to fees may not drive behaviour change if these fees represent only a small proportion of turnover.

Combinations of risk factors

The results of the regression analysis outlined in Section 4.4 suggest that the degree of risk associated with the risk factors for opening hours with patron intoxication is magnified when these risk factors are exhibited in combination. This suggests that higher fees should be charged to licensees exhibiting a combination of these risk factors relative to those that only exhibit one of the other of these risk factors.

In contrast to this, the results also suggest that the level of risk associated with hotel gaming is the same, regardless of closing time. This suggests that higher fees should not be charged to licensed premises with hotel gaming facilities that close late versus those that do not close late.

[17] Even with such a policy, there may still be a degree of measurement error.

These results are somewhat consistent with the system in Queensland, where an additive fee applies to venues exhibiting combinations of numerous different risk factors. This suggests that there is a case for applying a higher fee to licensees exhibiting a combination of risk factors for patron intoxication and opening hours.

Differentiating within risk factors

In relation to differentiation within risk factors, the results of the data analysis outlined in Section 4.4 have different implications for each of the risk factors. For opening hours, the results suggest some difference in the degree of risk, depending on whether a licensee closes between 11:01pm and 1:00am, between 1:01 and 3:00am, or after 3am.

For patron intoxication, the results suggest that the risk associated with infringements for patron intoxication is linear and increasing depending on the number of infringement received by a venue. For hotel gaming, the analysis does not provide any means to differentiate between licensees providing different levels of gaming facilities.

These results are broadly consistent with the system in Queensland, where a differential fee applies for late opening and compliance history. This suggests that there is a case for differentiating the fee levels within the risk factors for patron intoxication and opening hours.

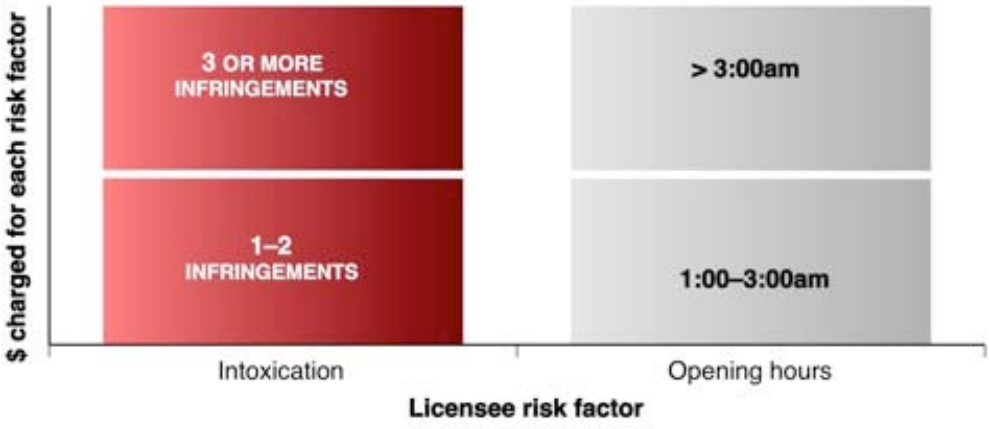
There are a number of ways in which fees could be differentiated within the risk factors for patron intoxication and opening hours. Two potential models are outlined below.

Model 1: Broad differentiation of fees within each of the three risk factors

The first option implies a broad level of differentiation amongst the two risk factors. There would be maximum and minimum charges for each of them depending on the characteristics and practices of the venue. In the instance that a licensee exhibits both risk factors (i.e. hours and patron intoxication), the sum of the incremental fees under each would apply.

Figure 5.2

BROAD DIFFERENTIATION OF FEES WITHIN THE TWO RISK FACTORS



In effect, this option would be similar to that in Queensland, whereby:

- those opening extended hours pay a higher fee, depending on when the trading occurs (e.g. morning trading represents a low additional risk over ordinary trading, whereas late trading represents a higher additional risk); and
- those with a poor compliance history pay a higher fee.

This option is broadly consistent with the results of the data analysis. In particular, the relativities are based on those outlined in Table 5.2 for the medium and high risk groups.

In addition, it is also broadly consistent with the practice in Queensland and has the potential to link the particular characteristics and practices of licensees at a broad level to higher fees, and therefore influence behaviour.

Under this model, an additional category for licensees that close between 11:01pm and 1:00am could also be included — consistent with the results of the basic data analysis. The results of the data analysis imply that the fee for this category should be approximately half the fee for the 1:01 and 3:00am category.

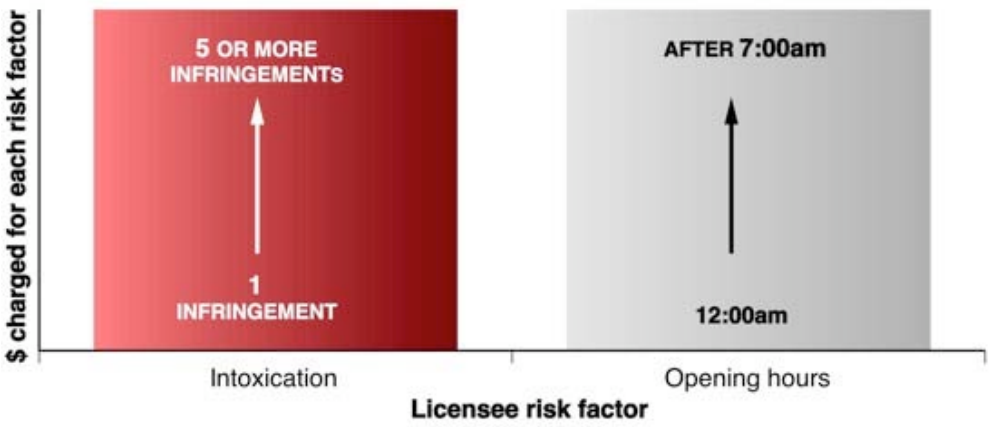
In addition, gaming could also be included. If hotel gaming were to be included, the fee charged would be consistent with the fee charged to licensees with one to two infringement or that close between 1:01 and 3:00am (i.e. consistent with Table 5.2). If club gaming were to be included, the fee charged should be lower than the fee charged for hotel gaming.

Model 2: Highly differentiated fees (even more tailored to the specific circumstances of the licences)

The second option builds on option one, but is more closely linked to the compliance history and opening hours of the licensee, such that fees would vary according to the precise number of infringements incurred by the licensee, and the particular time at which the licensee closes, if at all. Combinations would be dealt with in a similar way to that outlined for Model 1.

Figure 5.3

HIGHLY DIFFERENTIATED FEES



This option is less consistent with the results of the regression analysis because the results suggest that the risk associated with opening hours increases up to a certain closing time (after 3:00am) and then flattens off after that. It is also less consistent with the practice in Queensland, which does not differentiate to this level of detail. In addition, it is more complicated than option one.

Coverage

Table 5.3 provides a breakdown, by licence type, of the number of licensees exhibiting each risk factor, as well as those exhibiting combinations of risk factors or no risk factors. These figures may not reflect the true number of licensees in each of these categories due to missing values in the data set. These figures provide an indication of the number of licensees that might potentially be impacted by a risk based licensing system. For example 60 per cent of licensees do not exhibit any risk factors and opening hours is the risk factor exhibited the most (29 per cent of licensees).

In addition to the information in Table 5.3, the data indicates the following with respect to the differentiation within risk factors in Model 1:

- 274 licensees had one to two infringements;
- 63 licensees had three or more infringements;
- 593 licensees are licensed to close between 1:01 and 3:00am (does not include Packaged Liquor, some of which have extended trading hours, or Full Club, who are authorised to trade 24 hours, licensees); and
- 474 licensees are licensed to close after 3:00 (does not include Packaged Liquor, some of which have extended trading hours, or Full Club, who are authorised to trade 24 hours, licensees).

Table 5.3

NUMBER OF LICENSEES EXHIBITING RISK FACTORS (INCLUDING COMBINATIONS), BY LICENCE TYPE

License type	Risk factor combinations								
	No risk factor present	Gaming only	Opening hours only#	Patron intox. only	Gaming & opening hours#	Gaming & patron intox.	Opening hours and patron intox.#	Gaming, opening hours & patron intox.#	Total
Restricted Club Licence	1,197	0	0	2	0	0	0	0	1,199
Packaged Liquor Licence^	1167	0	747	1	0	0	0	0	1,915
Full Club Licence+	0	0	534	0	236	11	2	0	783
On-premises Licence	860	3*	436	13	13*	0	63	1*	1,389
General Licence	916	24	270	123	175	2	73	46	1,629
Total	4,140	27	1987	139	424	13	138	47	6,915
Total (%)	59.9%	0.4%	28.7%	2.0%	6.1%	0.2%	2.0%	0.7%	100.0%

Source: ACG analysis of Department of Justice data set
Notes:
#Opening hours refers to licensees permitted to trade after 1:00am.
+All Full Club licensees are authorised to trade 24 hours, but data is not available to determine which licensees exercise this. As such, all Full Club licensees are assumed to exhibit the risk factor for opening hours
^Opening hours for packaged liquor licensees indicates those with extended trading hours
*As On-premise licensees are not permitted to provide gaming facilities, these figures should be interpreted with caution. It is possible that these venues hold racing club licences and, therefore, have gaming facilities

Taking account of venue capacity

There is a relationship between venue capacity and alcohol-related harm. That is, a venue with larger patron capacity is more likely to be associated with alcohol-related harm than a smaller venue, all else being equal. The literature review found that larger venues are more likely to be associated with harm due to the fact that there are more patrons present at such venues (Homel & Clark n.d.). Although this finding could not be adequately tested in the data analysis, venue capacity should still be taken into account in determining the appropriate fee.

5.3 Factors to consider in determining the appropriate fee

This section considers different ways of assessing risk, and different time periods over which fees can be set.

Assessing risk

The risk of regulated entities (and therefore the fee that would be payable) can be assessed through either self-assessment by regulated entities themselves, or independently.

Of the risk-based models reviewed in Appendix F, the Queensland model involves self-assessment, the Ontario and Geelong models assess risk independently, whereas WorkSafe involves a combination (WorkSafe assesses claims history whereas employers identify their remuneration).

As an example, licensees in Queensland self-assess their level of risk (and their corresponding licensing fee) by choosing from several discrete options for each risk factor. Against the criteria of the provision of food, licensees can assess themselves as either offering meals up to two hours before closing time, or not offering meals up to this time (noting that for some licensees this question is not applicable). By providing discrete options from which licensees can self-assess, interpretation plays only a limited role in the assessment. Further, the regulator captures self-assessment information in a database, and investigates any apparent anomalies.

In contrast, licensees in Ontario are independently risk assessed by the Registrar of Alcohol and Gaming ('the Registrar'). This model considers a number of risk factors, including some that licence applicants would be inherently conflicted in self-assessing (such as assessing their own 'honesty and integrity'). The Registrar also has some discretion in determining the risk designation of a licence applicant, which would be inappropriate for licence applicants to exercise themselves.

Ultimately, risk assessment should depend on the role for discretion and interpretation in regulatory decision-making. Where risk factors are many, complex, and require objective assessment (e.g. due to a risk of fraud), independent assessment is more appropriate. Where risk factors are few and readily observable, with a low risk of fraud, self-assessment would be preferred (as self assessment requires the licensee to consider their own risk profile in the context of the fees).

Time period for fees

Risk-based fees may be set *prospectively* for the period ahead, or *retrospectively* for past behaviour. Three of the four models reviewed determine fees through a combination of both prospective and retrospective factors, with Geelong the only model to use only prospective factors (opening hours). In Queensland, the licensed premise's compliance history during the last financial year is one determinant of a licensee's fees for the next financial year. Similarly, the Ontario model assesses licence applicants' past conduct, as well as their experience, and honesty and integrity. WorkSafe Victoria considers the recent claims experience of both the industry and the employer in determining premium levels.

The preferred approach for setting fees is therefore largely determined by the risk factors included in the model.

5.4 Options for framing the fees

The fees could be framed as a lower fee or discount for those with a lower risk profile (as occurs with some workers compensation premiums, where an improvement in a firm's claims history eventually leads to a lower premium), or an additional fee or 'penalty' for those with a higher risk profile (as is the case with liquor licensing fees in Queensland).

The literature suggests that the way that a decision is framed, and whether it involves a 'loss' or not, can influence the decision itself.

> Losses (outcomes below the reference state) loom larger than corresponding gains (outcomes above the reference state) … a shift in reference can turn gains into losses and vice versa (Kahneman, Knetsch & Thaler 1991).

In this case, a 'gain' would be a discount for lower risk, whereas a 'loss' would be a higher fee for higher risk. Framing the fee as an additional cost or charge for those with a higher risk profile may have a greater impact on behaviour, due to the additional fee 'looming larger' than a discount.

There are two other models for applying fees that may be relevant if there is concern about the impact on the industry of large variations in fees, or large fees in themselves, namely fee caps and different payment options.

Caps

In a risk-based fee model, the fee that a regulated entity pays each period would vary based on changes to their assessed level of risk. WorkSafe Victoria's premium system limits variation in the amount paid by regulated entities each year to a maximum of 30 per cent through a premium variation cap.

Introducing a similar cap in relation to risk-based licensing fees would increase the complexity of administering the scheme. The regulator would need to establish an administrative system to determine when the cap should be applied, and how fees would need to vary to ensure that the costs of the scheme were recovered.

Capping the variation in fees that licensees pay each year would also limit the effectiveness of risk-based fees as a determinant of the behaviour of licensees. There would be no incentive under the scheme for a licensed premise to reduce its risk profile after the fee variation cap had been breached.

A fee variation cap would limit the annual variation in licensing fees for all venues. However, a cap would increase the fees paid by those venues that do not exceed the cap, as they are effectively subsidise those venues that do. To the extent that a cap would distort the link between a venue's assessed risk and the licensing fees that it pays, it would limit the effectiveness of the risk-based model.

Ultimately, whether to set a cap or not depends on:

- the degree of volatility in fees year on year;
- the extent to which the volatility could threaten the viability of industry participants; and
- whether concerns about industry viability extent to those that would be most affected by significant increases in fees.

It is also relevant to point out that different payment options (discussed below) could help licensees to adapt to any significant increase in fees without threatening their viability.

Payment options

A regulator may offer regulated entities alternative payment periods for risk-based fees. As an example, WorkSafe Victoria allows employers to pay premiums monthly, quarterly or annually, with a 3 per cent discount for those employers that pay annually.

Offering alternative payment periods may increase the regulator's administrative effort for a risk-based fee scheme.

Offering different payment options would become more attractive in the event that fees are likely to be significant, and/or fees are likely to vary significantly (as was discussed above).

Chapter 6

Conclusion and next steps

This report has considered a number of risk-based models for designing and applying licensee fees, see Table 6.4 which provides an overview. The ultimate objective is to encourage licensees to modify their behaviour.

Table 6.4

RISK-BASED MODELS

Area	Options considered
Applying the risk factors	• Set fee for each risk factor • Broad differentiation of fees • Highly differentiated fees
Assessment	• Self assessment • Independent assessment
Time period	• Prospective • Retrospective
Framing	• Lower fee for those with a lower risk profile • Higher fee for those with a higher risk profile
Accounting for large fees or variations	• Cap on fee increases • Different payment options (monthly, quarterly, annually)

There are three risk factors that should be used in determining the particular fees: gaming, trading hours, and intoxication infringements.

The analysis suggests different levels of relative risk between different types, levels and combinations of these risk factors, as outlined in Table 5.2. The risk relativities imply different fee weightings that could be applied depending on the different types, levels and combinations of risk factors exhibited by licensed premises. The outcome would be that higher risk premises would be charged a higher fee.

The two models for differentiating fees within the risk factors differ in the extent to which they reflect the data analysis, the approach in Queensland, and complexity. On these measures, model one (broad differentiation) is the better approach.

The literature review found that larger venues are more likely to be associated with harm due to the fact that there are more patrons present at such venues. Although this finding could not be adequately tested in the data analysis, venue capacity should still be taken into account in determining the appropriate fee.

In terms of how risk should be assessed, given that only three risk factors are suggested that are relatively simple to assess:

- if there are no reasons to think fraud would be a major issue, self assessment would be appropriate (perhaps backed up with penalties for false information); and

- otherwise independent assessment would be appropriate — perhaps using a blended approach like WorkSafe (where the licensee would assess venue type and trading hours, but compliance history would be independently assessed), although in this scenario the compliance database would need to be accurate and up to date if this were to occur.

Setting fees will likely need to take account of both prospective and retrospective elements, depending on the risk factors used in the model. In addition, the literature suggests that fees should be framed or presented as additional costs due to higher risk. Finally, different payment options should be considered if fees are likely to be significant, and/or vary significantly.

Moving forward, there are a number of areas where better data in future would be useful in refining the model itself (for example, information on other types of venues — currently unknown — would give a better feel for the precise extent to which gaming represents an elevated risk relative to other venue types), and conclusively determining whether other risk factors should be included (such as live and recorded entertainment).

Appendix A

National estimates of the costs of alcohol-related harm

A.2 Costs of alcohol-related harm

The Collins and Lapsley (2008) study have estimated the national costs for alcohol-related harm for 2004-05. These estimates are outlined in Table A.1 and Table A.2 and form the basis for the costs estimated in this study. The estimates outlined in Table A.3 document the budgetary impacts on government for 2004-05, noting Victorian estimates are based on these costs.

Table A.1

TANGIBLE SOCIAL COSTS OF DRUG ABUSE, 2004/05

	Alcohol ($m)	Tobacco ($m)	Illicit drugs ($m)	Alcohol & illicits together ($m)	Total ($m)	Total adjusted for interaction ($m)
Labour in the workforce						
Reduction in workforce	3,210.70	4,969.50	889.4		9,069.50	8,872.10
Absenteeism	367.9	779.6	733.5		1,880.90	1,840.00
Total	**3,578.60**	**5,749.10**	**1,622.90**		**10,950.50**	**10,712.10**
Labour in the household						
Premature death	1,423.90	9,156.40	458.5		11,038.80	10,798.50
Sickness	146.9	686.7	37		870.6	851.7
Total	**1,570.80**	**9,843.10**	**495.5**		**11,909.40**	**11,650.20**
Total paid and unpaid labour costs	**5,149.40**	**15,592.20**	**2,118.30**		**22,859.90**	**22,362.20**
Less consumption resources saved	**1,611.30**	**7,583.10**	**469.5**		**9,663.90**	**9,453.50**
Total net labour costs	**3,538.00**	**8,009.10**	**1,648.90**		**13,196.00**	**12,908.70**
Healthcare (net)						
Medical	540.7	158.4	104.7		803.8	786.3
Hospital	662.2	223.4	86.5		803.8	786.3
Nursing homes	401.2	-177.3	6.2		230.1	225.1
Pharmaceuticals	297.6	77.3			375	366.8
Ambulances	74.8	36.6	4.4		115.8	115.8
Total healthcare	**1,976.70**	**318.4**	**201.7**		**2,496.80**	**2,445.00**
Road accidents n.e.i.	**2,202.00**		**527.6**		**2,729.60**	**2,729.60**
Fires n.e.i.		**63**			**63**	**63**
Crime n.e.i.						
Police	747.1		1,716.90	320.2	2,784.20	2,784.20
Criminal courts	85.8		146.8	28	260.7	260.7
Prisons	141.8		348.6	146.6	636.9	636.9
Property	67.1		445.4	144.6	657.1	657.1
Insurance administration	14.3		94.6	30.7	139.6	139.6
Productivity of prisoners	368		892.1	387.7	1,647.90	1,647.90
Total crime	**1,424.00**		**3,644.50**	**1,057.80**	**6,126.30**	**6,126.30**
Resources used in abusive consumption	**1,688.80**	**3,635.60**	**892.7**		**6,217.10**	**6,217.10**
Total	**10,829.50**	**12,026.20**	**6,915.40**	**1,057.80**	**30,828.90**	**30,489.80**
Proportion of total unadjusted tangible costs	**35.10%**	**39.00%**	**22.40%**	**3.40%**	**100.00%**	

Source: Collins and Lapsley 2008.

Table A.2

INTANGIBLE SOCIAL COSTS OF DRUG ABUSE, 2004-05

Cost type	Alcohol ($m)	Tobacco ($m)	Illicit drugs ($m)	All drugs ($m)	All drugs adjusted for health interaction ($m)
Loss of life	4,135.0	19,459.7	1,204.7	24,799.5	24,259.6
Pain and suffering (road accidents)	353.6		69.7	423.4	423.4
Total intangible costs	4,488.7	19,459.7	1,274.5	25,222.9	24,683.0
Proportion of unadjusted total intangible costs	17.8%	77.2%	5.1%	100.0%	

Source: Collins and Lapsley 2008.

Table A.3

IMPACT OF ALCOHOL MISUSE ON STATE GOVERNMENT BUDGETS, 2004/05

Outlays	$ million
Health	
Hospitals	251.7
Medical	0.0
Nursing homes	15.4
Ambulances	34.3
Total health	**301.4**
Road accidents n.e.i.	**87.8**
Crime n.e.i.	
Police	747.1
Criminal courts	85.8
Prisons	41.8
Total crime n.e.i.	**974.6**
Total outlays	**1,363.8**
Net revenue minus outlays	**(387.3)**

Source: Collins and Lapsley 2008.

Appendix B

Methodology for estimating costs

B.1 Source of data for cost-estimations

This assessment of the social cost of alcohol-related harm in Victoria uses the prior work by Collins and Lapsley (2008). Their study measures a range of tangible and intangible costs at a national level. Appendix A presents the results of their work, with a key finding being that the cost of alcohol-related harm is estimated at $15.3 billion in 2004-05. The impact of alcohol misuse on combined state government budgets is also estimated at $1.4 billion in 2004-05. These estimates are used as the basis of the calculations for this project.

While the methodological approach to estimating individual costs is more fully explained in Collins and Lapsley (2008), Appendix B of this report outlines the approach for the estimation of Victorian Government costs and the costs most relevant to this review. These are the costs that should be considered when designing a differentiated risk-based fee structure to attribute the costs of alcohol-related harm to licensed premises. The data sources for estimating Victorian Government costs is also briefly summarised in Appendix B, given Task 6 of this review, which seeks to identify any data limitations.

There are some elements of the methodology adopted for this project where cost estimation varies from the approach used in Collins and Lapsley (2008). For example, the following costs have been included:

- government prevention, education and research
- emergency department presentations
- foregone payroll tax for government from premature mortality.

These costs are not estimated in Collins and Lapsley (2008) and Appendix B outlines the methodology applied to develop these estimates.

The costs measured by Collins and Laplsey (2008) are prevalence costs. That is, they cover the total costs associated with alcohol-related harm for a particular year — in this instance 2004-05 — rather than just measuring the incidence of new cases stemming from alcohol-related harm in a particular year. This is important as, from a health care perspective, it means costs may be incurred from injuries stemming from many years prior to 2004-05.

The social costs included for this review include not only the costs of alcohol-related harm, but also the costs of alcohol and illicit drug use, acting together in the cause of crime. This follows the approach of Collins and Lapsley (2008), noting such costs are reported separately for this project.

B.2 Method for estimating Victorian costs for 2007-08

Collins and Lapsley (2008) estimate costs at a national level and at a combined state and territory level for 2004-05. In order to convert these costs to Victorian estimates, population adjustments are made to reflect the state share of total costs. Further adjustments are also made to reflect the real costs faced in 2007-08.

Population adjustments: Victorian total costs

In order to estimate Victorian costs, the Victorian share of the national population has been adjusted to account for the proportion of Victorians who consume levels of alcohol that are at a risky or high-risk level, with definitions of level of risk summarised in Table B.1.

Table B.1

ALCOHOL RISK LEVELS

	Consumption per day	
Risk level	**Males**	**Females**
Low risk	50 mLs or less	25 mL or less
Risky	More than 50 mLs, up to 75 mLs	More than 25 mLs, up to 50 mLs
High risk	More than 75 mLs	More than 50 mLs

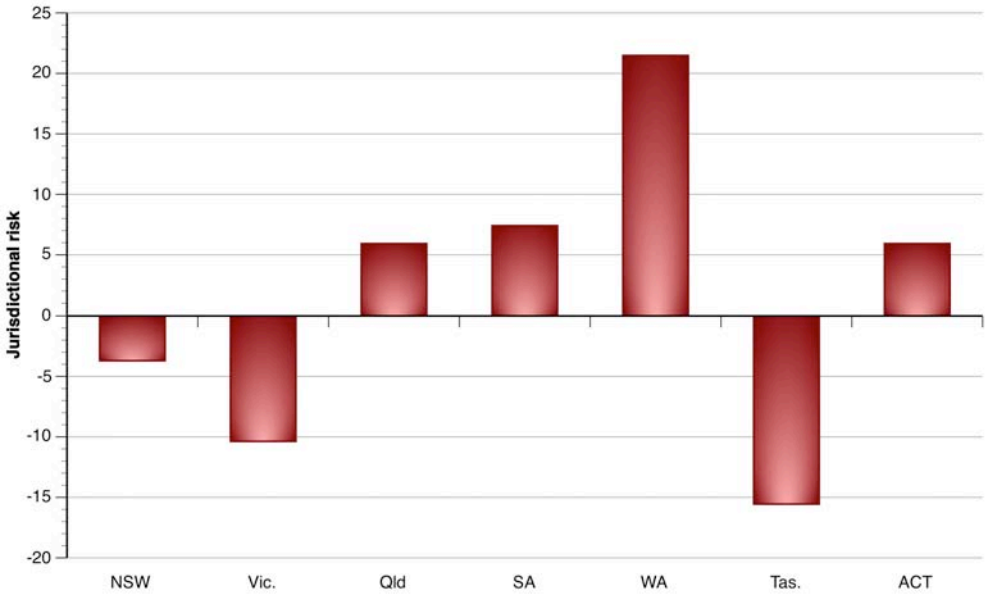
Source: ABS Cat no. 4364.0, 2006.

In 2004-05, Victorians accounted for 24.75 per cent of the Australian population (ABS Cat no. 3101.0, 2009). As Victoria accounts for proportionally fewer high-risk and risky consumers of alcohol than most of other jurisdictions (with the exception of Tasmania) — see Table B.2 — this population estimate was adjusted downwards to reflect this. For instance, in 2004-05, the incidence of risky and high-risk alcohol consumption in Victoria was 10.4 per cent lower than the national average[18]. In comparison, the incidence of risky and high-risk alcohol consumption in Western Australia was 21.5 higher than the national average per head of population (ABS Cat No. 4364.0, 2006). Consequently, Victorian cost estimates have been calculated at 22.18 per cent of the total social costs used in the Collins and Lapsley (2008) study.

[18] This is a conservative estimate. The National Drug Strategy Household Survey conducted by the Australian Institute of Health and Welfare (AIHW) also published data on the incidents of risky and high risk drinking behaviour in Australia by State and Territory in 2004. It found that the incidents of risky to high risk drinking activity that led to harm in the long term was 12 per cent lower in Victoria than the national average.

Table B.2

INCIDENCE OF UNHEALTHY DRINKING ACTIVITY, BY JURISDICTION, RELATIVE TO THE NATIONAL AVERAGE



Source: ABS Cat no. 4364.0, 2006.

Population adjustments: Victorian costs to government

In order to estimate the Victorian share of total state and territory budgetary estimates calculated by Collins and Lapsley (2008), a similar methodology was applied as that used for the total Victorian cost estimates.

Updating estimates to 2007-08

It is appropriate to update the Collins and Lapsley (2008) 2004-05 estimates to reflect costs faced in 2007-08. The indices applied in Table B.3 were used to update the various cost components for the study.

Table B.3

INDICES APPLIED TO THE 2004-05 COST ESTIMATES

Index used	Cost component	Indexation rate
Health consumer price index	Health care costs	110.9%
Wage price index	Labour in the household Labour in the workforce	112.6%
Consumer price index	Crime Resources used in abusive consumption Intangible costs Road accident costs	114.2%

Source: ABS Cat no. 6401.0, 2009, ABS Cat no. 6345.0, 2009.

Population growth estimates of 105.47 per cent were also applied to total cost estimates to account for the fact that there has been population growth since 2004-05 (ABS Cat 3235.0, 2009). Estimates were based on the growth of the population aged 15 years and over to reflect that minors under 15 years of age are less likely to be consumers of alcohol.

Revenue adjustments

Collins and Lapsley (2008) calculate the net expenditure for state and territory budget estimates. Specifically adjustments are made for the impact of tax revenues to governments from the sale of alcohol. These revenue adjustments are estimated for Victoria at $282.7 million for 2007-08. While Victoria does receive revenues from the consumption of alcohol raised through the Goods and Services Tax, this study is concerned with estimating the impact of the costs of alcohol-related harm for the Victorian Government, irrespective of revenues received.

B.3 Methodology for cost estimates used in this study

The methodology for estimating total national costs for alcohol-related harm is provided in detail in Collins and Lapsley (2008). The costs most relevant for this study are the costs faced by the Victorian Government.

Table B.4 outlines the methodology used for calculating each cost component for the Victorian Government estimates, and the source of data for estimating such costs. The following sections outline the approach taken by ACG in estimating costs not covered by Collins and Lapsley (2008) — which are deemed important for this study.

Table B.4

COLLINS AND LAPSLEY (2008): ASSUMPTIONS FOR ESTIMATING COST COMPONENTS

Cost	Methodology	Data source
Hospitals	Specialist estimation derived from identified alcohol related morbidities using population, mortality and morbidity data and applying age, sex and condition specific aetiological fractions.	ABS, *Deaths in Australia, 2004* Cat no. 3302.0 ABS, Population by Age and Sex, *Australian States and Territories, June 2005* Cat no. 3201.0 *The Quantification of Drug-Caused Mortality and Morbidity in Australia*, 1995 and 1998 edition AIHW unpublished unit record data National Hospital Costing Data
Emergency departments	An estimated cost per presentation (based on the minimum cost to the consumer of presenting at a private hospital emergency department) was applied to the number of alcohol related emergency department presentations in Victoria.	*Victoria's Alcohol Action Plan 2008-2013*
Ambulances	Data on ambulance arrivals at hospital with alcohol-attributable conditions in Western Australia was scaled up using an attribution fraction to estimate total ambulance services. This result was used to estimate Australia-wide costs.	*Report on Government Services 2006* (Attachment 8A) Western Australian Government Department of Health (unpublished)
Road accidents	The proportion of road accidents attributable to the consumption of alcohol was applied to aggregate estimate of road crash costs in Australia in 1996 and updated to 2004/05 values using domestic final demand.	ABS, *Australian National Accounts: State Accounts* Cat no. 5242.0 Bureau of Transport Economics (2000), *Road Crash Costs in Australia*
Police	Proportions of detainee hours in police custody was applied to cost data according to the crime. Attributable fractions linking crimes to alcohol consumption were then applied.	Steering Committee Reports Taylor and Bareja (2005), *2002 National Policy Custody Survey* Drug Use Monitoring in Australia (DUMA) project
Criminal courts	Applied attributable fractions to cost data.	Steering Committee Reports Taylor and Bareja (2005), *2002 National Policy Custody Survey* Drug Use Monitoring in Australia (DUMA) project
Prisons	Applied attributable fractions to cost data.	Steering Committee Reports ABS, *Prisoners in Australia*, Cat no. 4517.0 Drug Use Careers of Offenders (DUCO) project
Government education and research programs	Aggregated specific program budgets	*Victoria's Alcohol Action Plan 2008-2013*
Foregone payroll tax	Workforce participation rate was applied to the number of alcohol related deaths. Total wage earning potential was assumed to be equivalent with the median wage in Victoria for each participant. Payroll tax rate was then applied to the total unearned wages.	Turning Point Alcohol and Drug Centre (2007) *Victorian drugs statistics handbook: Patterns of drug use and related harms in Victoria* ABS *Regional Wage and Salary Earner Statistics, Australia, 2004-05* Cat no. 5673.0 ABS *Australian Social* Trends, 2007 Cat no. 4102.0

Source: Collins and Lapsley 2008. Note: Collins and Lapsley also estimate the costs of nursing homes however it is unclear what methodology or data sources were used for this estimation.

Estimates of government education and research programs

Government education and research programs

Collins and Lapsley (2008) excluded the cost to government of research and education dedicated to reducing the incidence of excessive alcohol consumption from social cost estimates. Their study argued, in accordance with the *International Guidelines for Estimating the Cost of Substance Abuse* (Single et al., 2003), that research and education costs represent the effects of public decisions to reduce abuse rather than the direct effects of abuse. This study has included these costs as they represent a significant indirect cost to government.

The cost to the Australian and Victorian Government of alcohol research and education programs has estimated based on specific funding initiatives as published in budget papers. For example: the Australian Government's 2006-07 budget provided substantial funding towards addressing alcohol misuse and treatment initiatives. As set out in Table B.5, the budget provided $30.2 million towards two education and promotion initiatives.

Table B.5

FEDERAL FUNDING FOR RESEARCH, PREVENTION AND EDUCATION INITIATIVES

Initiative	Funding
National Safe Use of Alcohol Strategy – media campaign A national campaign to discourage abuse of alcohol. The campaign aimed to: • increase awareness of the significant costs to individuals, families, communities and the economy of alcohol abuse • increase awareness of the Australian Alcohol Guidelines and what constitutes low-risk drinking • build effective partnerships between the health sector, police and industry to reduce alcohol-related harm.	$25.2 million
Drink Wise Australia Funding provided to Drink Wise Australia to provide alcohol education programs.	$5 million

Source: Pyne 2006.

It has been assumed that the Australian Government allocated similar funding to education and research programs in 2007-08, with costs being apportioned to Victoria using a population pro rata approach. This is equivalent to $7.8 million.

Similarly, the Victorian Government delivers a range of research, prevention and education initiatives relating to alcohol-related harm, with *Victoria's Alcohol Action Plan 2008–2013* providing the primary means of coordination (The Victorian Government 2008a).

The plan sets out the Victorian Government's approach to preventing and minimising harm associated with alcohol misuse. It is supported by a financial commitment of $37 million over four years — it has been assumed that spending is spread evenly over the four areas. There are four specific initiatives included in the plan that directly involve research, prevention and education, as summarised in the table below.

Table B.6

***VICTORIA'S ALCOHOL ACTION PLAN 2008-13*: RESEARCH, PREVENTION AND EDUCATION INITIATIVES**

Initiative	Funding
Community awareness Promoting safe and sensible alcohol use through a community awareness campaign aimed at changing community acceptance of intoxication and drunkenness and reducing the incidence of risky drinking.	$4.3 million over three years
Early intervention An early alcohol intervention program to improve the way risky and high-risk drinkers are identified and supported to reduce their drinking. This will include a range of community based alcohol education strategies as well as online and telephone screening to enable people to confidentially assess their personal risk in relation to alcohol.	$4.7 million over four years
Compliance Establish a compliance directorate and an assault reduction strategy to better focus enforcement activity on high-risk licensed venues and to assist in reducing the number of assaults and other offences in and around these venues	$18 million over four years
Research A Victoria Police safe streets public safety research and evaluation.	$1.2 million over two years

Source: The Victorian Government 2008b.

Collectively, funding for these initiatives amounts to $28.2 million over four years. This is equivalent to $7.1 million per annum. However, the Victorian Government also supports a number of additional research, prevention and education initiatives outside of the Action Plan, which would represent an additional cost. As examples of these initiatives:

- Victoria's contributions to national research, prevention and education efforts, such as through COAG;
- research funds granted by the Victorian Government;
- funding to not-for-profit organisations (such as Turning Point) to undertake research, prevention and education; and
- a proportion of the budget of Responsible Alcohol Victoria, to the extent that its activities involve research, prevention and education.

As such, the cost estimates for government spending on research and education programs represents a very conservative approach.

Payroll tax revenue implications

Foregone payroll tax has been included to account for the impact on Victorian Government revenue resulting from the reduction in labour in the workforce due to alcohol consumption. The cost of reduced payroll tax due to deaths attributable to alcohol was calculated using the following assumptions:

- the workforce participation rate for the population that died was the same as for the population as a whole, 64.1 per cent (ABS Cat no. 4102.0, 2008);
- the median wage for the population that died was the same as for the population as a whole, $35 426 (ABS Cat no. 5673.0, 2008); and

- all the employers paid payroll tax.

The number of deaths attributable to alcohol (759) was sourced from Turning Point Alcohol and Drug Centre's publication *Victorian drugs statistics handbook: Patterns of drug use and related harms in Victoria* (2007). The payroll tax rate was sourced from the State Revenue Office Victoria.

This approach underestimates the total indirect cost to the Victorian Government because it does not quantify the foregone payroll tax from reduced workforce participation due to alcohol abuse or from individuals incarcerated due to alcohol-related crime.

Emergency Departments

Emergency departments are categorised as an outpatient medical service. As such, the cost of providing medical services that do not lead to hospitalisation has not been captured in Collins and Lapsley study (2008). The additional cost to Victoria of providing this medical service has been calculated using the following assumptions:

- there are 8000 alcohol-related emergency department presentations per year (Victorian Government, 2008a); and
- the 2007-08 cost of treating an alcohol-related emergency department presentation is $200 (this is the minimum cost of presenting at the Epworth Private Hospital Emergency Department).

Appendix C

Detailed regression results

This appendix briefly elaborates on the data set, regression methodology and results discussed in Chapter 4.

C.1 Data considerations

There are three important data considerations relating to the regression analysis as follows.

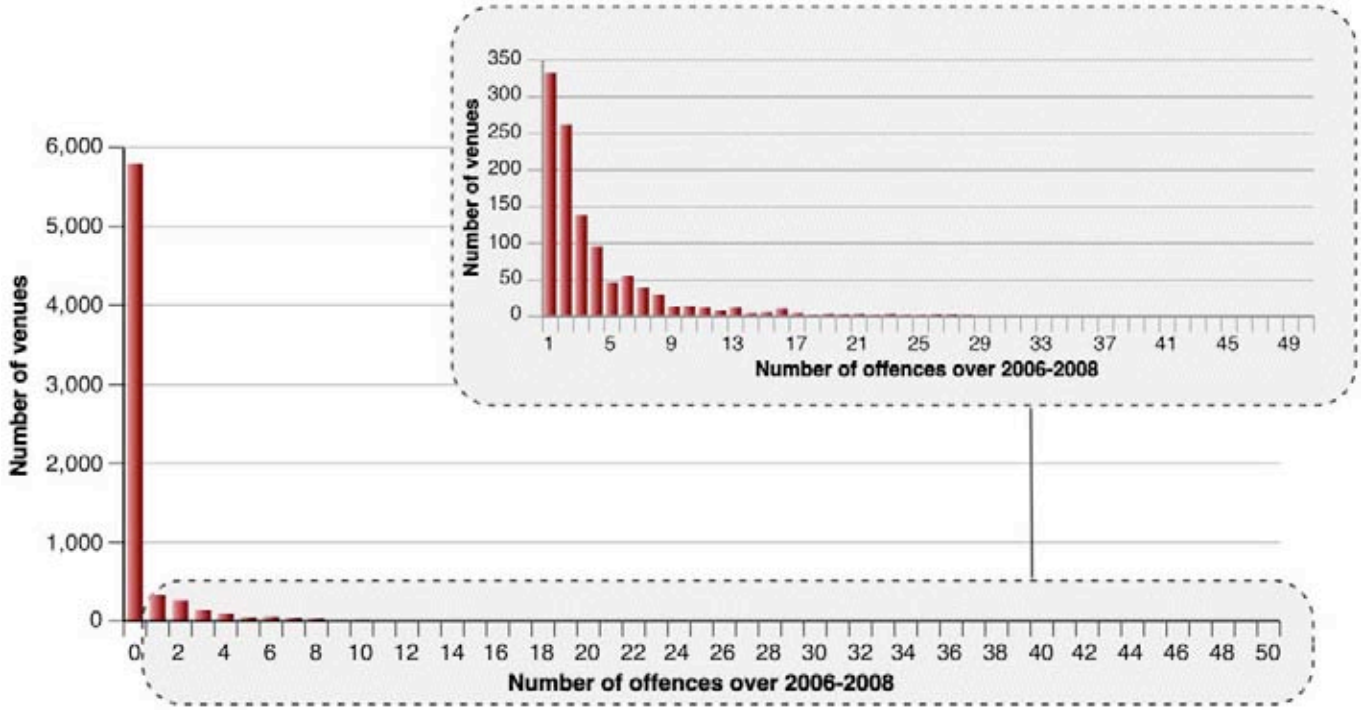
Firstly, the regression analysis was not based on the entire data set outlined in Chapter 4, as information on the predictor variables was mostly only available for licensees with a General or On-premises Licence. As a consequence, licensees with a Full Club, Restricted Club or Packaged Liquor licence were excluded from the regression analysis. However, this is not likely to materially impact the results as analysis of the data suggests the majority of offences are linked to General or On-premises Licensees. As a consequence, the regression analysis is based on data for 3018 General and On-premises licensees taken from the data set. It is important to note also that the data set provided for the analysis did not include BYO Permit, Pre-retail, Limited and Vigneron's licensees. In addition, a significant number of restaurants were missing from the data for On-premises licensees.

Secondly, for a number of reasons, the data for General and On-premises Licensees (as well as the broader data set) contains missing values for the variables representing venue capacity, venue type and late opening hours. Therefore, it has been necessary to assume that, on average, the observations with missing values represent licensees with a low risk of being associated with alcohol-related harm, which seams reasonable given the results of the basic statistical analysis for the groups of unknown licences.

Thirdly, the distribution of the explanatory variable is highly skewed and contains a large number of observations with a value of zero. Figure C.1 depicts the distribution of licensees according to the number of offences over the period 2006 to 2008. It demonstrates, that the majority of licensees (5796 licensees or 84 per cent of total licensees) were not associated with any offences over the period, which is driving the large number of observations with a zero value. A total of 332 venues (or 5 per cent) were associated with one offence, and 262 venues (4 per cent) were associated with two offences and so on. The right-hand side of the figure indicates that there were a small number of venues that were associated with high rates of offences over the period. The model selected for this analysis must take account of this distribution.

Figure C.1

DISTRIBUTION OF LICENSEES ACCORDING TO THE NUMBER OF OFFENCES OVER 2006-2008



C.2 Methodology

As the data for the explanatory variable (the number of offences linked to each venue over the period 2006-08) is a count variable, it is most appropriate to use a regression model for count outcomes. In addition, this model must take account of the specific distribution of the explanatory variable. As outlined above, the data for the number of offences is positively skewed and contains a significant number of observations where the number of offences equals zero.

A number of count models were explored, including the Poisson regression model and the negative binomial regression model. However, due to the existence of so many observations where the offences variable equals zero, the zero-inflated negative binomial model was selected as the optimal model given the nature of the explanatory variable. Various statistical tests were undertaken (including the Vuong test of non-nested models) to determine the optimal count model with the evidence in favour of the zero-inflated negative binomial model.

Zero-inflated negative binomial regression models give more weight to the probability that the count variable equals zero. It incorporates an underlying mechanism that splits venues between those that are almost certain never to be associated with an offence (the 'certain zero' group) and those that pose at least a small risk of being associated with an offence (the 'not always zero' group). This model makes sense in this case as it could reasonably be expected that many of the venues contained in the data set (for many different reasons) are rarely associated with an incident. Only a small proportion of venues in the data set were associated with an incident of alcohol-related harm, and these tended to be clustered around certain venue types (such as venues opening late hours, and gaming venues). In contrast, other venue types, such as restaurants, are rarely associated with an incident.

C.3 Results

The results from the regression analyses are outlined in Table C.1 and discussed in great detail in Chapter 4. In relation to the explanatory power of the model, the likelihood ratio test is rejected at a very high level of significance (with a likelihood ratio statistic of 248) suggesting good explanatory power of the model as a whole.[19]

The overall regression analysis involved a number of additional model runs to generate results for the purpose of informing the design of a risk based licensing model. To save on space, the complete results of these additional runs are not provided in this report, rather the specific coefficient results for the variables of interest are discussed as necessary throughout Chapter 4. In addition, the results for other variables included in the regression, such as venue capacity and region, are also not included (for reasons discussed in Chapter 4).

Chapter 4 also includes estimates of marginal effects and predicted outcomes based on the estimated coefficients. These were calculated by taking the exponential of the relevant coefficient results (i.e. EXP(coeff.)), which is necessary in the instance that modelling results are generated using zero-inflated negative binomial regression models (Jones et al. 2007 p.283).

[19] The regression technique underpinning this model does not have an equivalent R-Squared statistic as found in standard OLS regression. Rather, a Pseudo R-Squared statistic is generally used. As these have a different interpretation to the standard R-Squared (i.e. not the proportion of variance of the explanatory variable explained by the predictor variables) they are not reported here.

Table C.1

REGRESSION RESULTS

Variable	Sub-group	Coefficient	Std. Err.
Constant	N/A	0.248***	0.087
Venue infringements (at least one)	N/A	0.488***	0.097
Venue type	Live and recorded music	0.537***	0.138
	Hotel gaming	0.490***	0.146
	Licensees with restaurant conditions	-1.464**	0.571
	Adult entertainment	-0.284	0.274
Venue closing time	1:01-3:00AM	0.291**	0.132
	3:01-5:00AM	0.630***	0.165
	5:01-7:00AM	0.316*	0.180
	24 hours	0.681***	0.198
Other outputs	Number of observations	3018	
	LR chi2(15)	247.9	
	Prob > chi2	0.000	

Source: Allen Consulting Group analysis

Note: z-test: *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level; For simplicity, the model results for venues in the 'certain zero' group are not reported here as they are interpreted differently to those for the 'not always zero' group provided above.

Appendix D

Further information on the break-up of licensees

This appendix provides a selection of pie charts depicting licensee groups or characteristics as a proportion of all licensees.

Figure D.1

GENERAL AND ON-PREMISES LICENSEES BY LATE OPENING HOURS

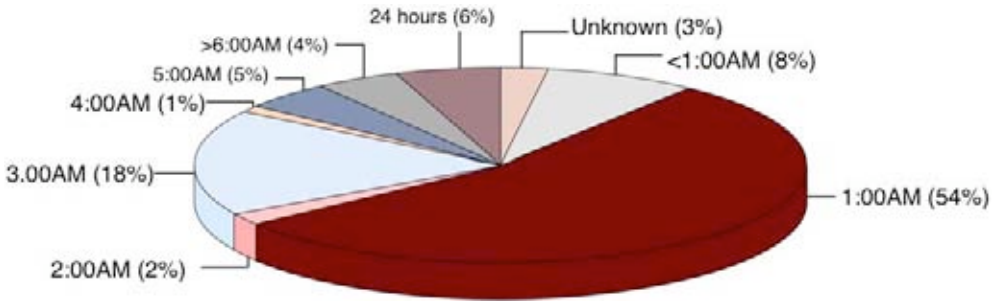


Figure D.2

GENERAL AND ON-PREMISES LICENSEES BY VENUE TYPE

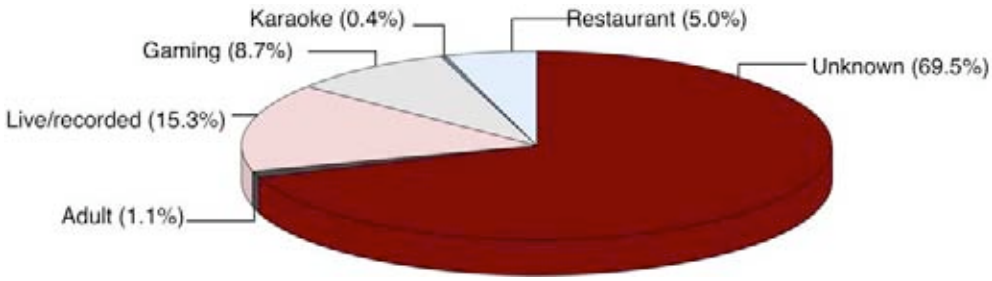


Figure D.3

GENERAL AND ON-PREMISES LICESEES BY VENUE CAPACITY

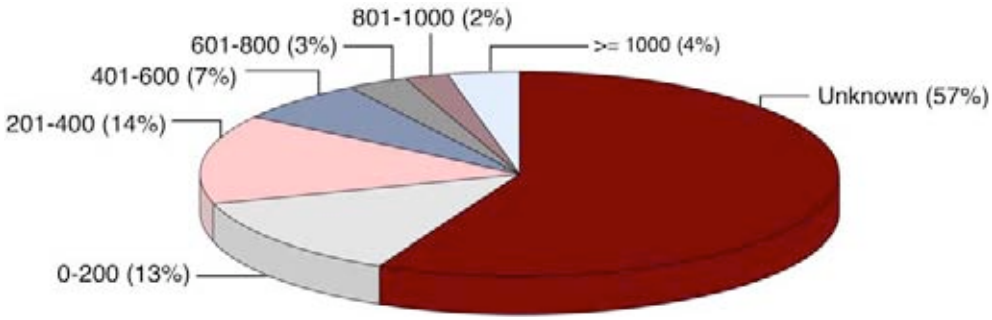


Figure D.4

LICENSEES BY LICENCE TYPE

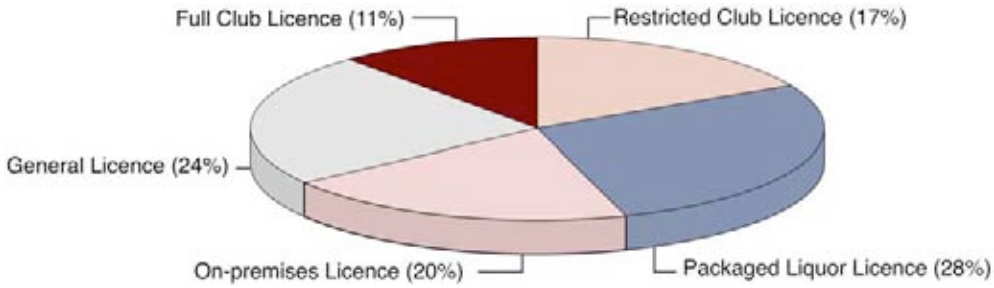
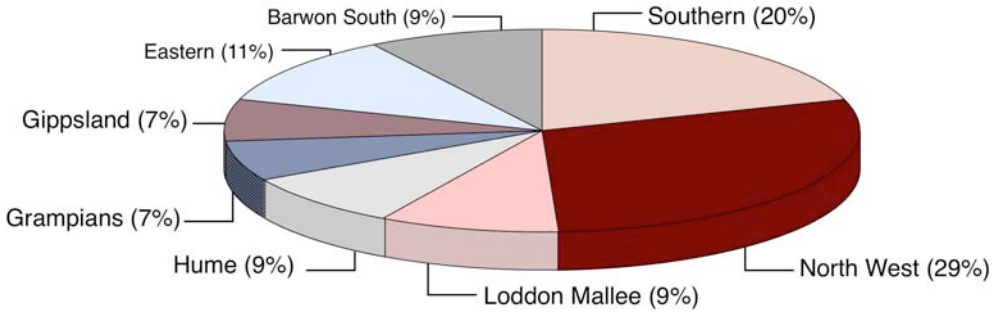


Figure D.5

LICENSEES BY REGION



Appendix E

Summary of data review results

The results of the data review are summarised in Table E.1.

Table E.1

DATA REVIEW – SUMMARY OF RESULTS

Potential risk factor	Licence type	Category	No offences		At least one offence		Total	Results of regression analysis*
			Number	Per cent	Number	Per cent	Number	
Licence type	All	Restricted Club	1,187	99%	12	1%	1,199	Unable to test
		Packaged Liquor	1,820	95%	95	5%	1,915	Unable to test
		On-premises	1,132	81%	257	19%	1,389	Unable to test
		General	969	59%	660	41%	1,629	Unable to test
		Full Club	688	88%	95	12%	783	Unable to test
Region	All	Unknown	6	100%	0	0%	6	
		Southern	1,155	83%	231	17%	1,386	
		North West	1,638	81%	373	19%	2,011	Insignificant r'ship
		Eastern	659	87%	100	13%	759	Insignificant r'ship
		Hume	512	86%	86	14%	598	Insignificant r'ship
		Grampians	379	85%	69	15%	448	Insignificant r'ship
		Gippsland	383	82%	83	18%	466	Insignificant r'ship
		Loddon Mallee	538	86%	87	14%	625	Insignificant r'ship
		Barwon South	526	85%	90	15%	616	Insignificant r'ship
Venue capacity	General and On-premises	Unknown	1,375	80%	351	20%	1,726	Unable to test
		0-100	110	80%	27	20%	137	Unable to test
		101-200	194	75%	66	25%	260	Unable to test
		201-400	220	52%	204	48%	424	Unable to test
		401-600	81	41%	118	59%	199	Unable to test
		601-800	42	42%	57	58%	99	Unable to test
		801-1000	28	44%	36	56%	64	Unable to test
		1000 and up	51	47%	58	53%	109	Unable to test
Venue closing time (latest closing time on any night of the week)	General and On-premises	11:00pm or unknown	73	91%	7	9%	80	
		11:01pm-1:00am	1,464	79%	397	21%	1,861	
		1:01-2:00am	39	57%	29	43%	68	Positive r'ship
		2:01-3:00am	310	58%	225	42%	535	Positive r'ship
		3:01-4:00:00am	15	48%	16	52%	31	Positive r'ship
		4:01-5:00:00am	57	40%	85	60%	142	Positive r'ship
		6:01-7:00:00am	55	41%	78	59%	133	Positive r'ship
		24 hours	88	52%	80	48%	168	Positive r'ship

	Packaged Liquor	Standard hours	1,118	96%	49	4%	1,167	
		Non standard hours	702	94%	46	6%	748	Unable to test
Venue type (based on activities authorised under licence)	General and On-premises	Unknown	1,647	79%	447	21%	2,094	
		Restaurant	143	94%	9	6%	152	Negative r'ship
		Karaoke	7	54%	6	46%	13	Unable to test
		Adult entertainment	17	52%	16	48%	33	Insignificant r'ship
		Live and/or recorded music+	208	45%	254	55%	462	Positive r'ship
		Gaming	79	30%	185	70%	264	Positive r'ship
	Full club	Gaming not permitted	519	97%	17	3%	536	
		Gaming permitted	169	68%	78	32%	247	Unable to test
Infringements	All	No Infringements	5,690	87%	888	13%	6,578	
		One Infringement	69	35%	130	65%	199	Positive r'ship
		Two infringements	25	33%	50	67%	75	Positive r'ship
		Three infringements	7	18%	31	82%	38	Positive r'ship
		Four infringements	4	33%	8	67%	12	Positive r'ship
		Five infringements	1	13%	7	88%	8	Positive r'ship
		Six or more infringements	0	0%	5	100%	5	Positive r'ship
		Has not had an infringement	5,690	87%	888	13%	6,578	
		Has had at least one infringement	106	31%	231	69%	337	Positive r'ship
Combinations#	General and On-premises	Gaming and trades after 1am	68	29%	167	71%	235	Insignificant r'ship
		Gaming and at least one infringement	13	27%	36	73%	49	Insignificant r'ship^
		At least one infringement and trades after 1am	43	23%	140	77%	183	Positive r'ship

Source: Allen Consulting Group analysis

*Outlines high-level results of the regression analysis. The regression analysis involved a series of models where the venue risk factors were regressed against the number of offences. Key:

- Unable to test: was not possible to test relationship in a robust manner through the regression analysis due to limited or missing data
- Insignificant r'ship: regression results suggest a statistically insignificant correlation (at or below the 10% level) between the variable and the rate of offences at venues
- Positive r'ship: regression results suggest a positive correlation (statistically significant at or below the 10% level) between the variable and the rate of offences at venues
- Negative r'ship: regression results suggest a negative correlation (statistically significant at or below the 10% level) between the variable and the rate of offences at venues

#The results of the regression in relation to combinations indicate whether the combination is associated with an additional degree of risk relative to the variables on their own

^This result may be driven by the small number of cases in this group (only 49) and, therefore, should be interpreted with caution

+Results for live and recorded music should be interpreted with caution due to data limitations, see Section 4.4 for an explanation

Appendix F

Risk-based regulatory models

A prominent theme within the regulatory good practice literature is the identification of risk and its consequences, and using this information to inform regulatory design (see Government of Victoria 2007). Risk-based regulatory models are applied across many different jurisdictions and regulatory contexts.

This section describes four risk-based regulatory models, which are:

- Queensland's risk-based liquor licensing fees;
- Ontario's risk-based liquor licensing regime;
- Greater Geelong's late licensees land rate differential; and
- WorkCover Victoria's risk-based workplace injury insurance.

Each of these models is described in terms of its policy objectives, risk factors, approach to risk assessment, and basis for setting fees.

F.1 Queensland: risk-based liquor licensing fees

In 2008, Queensland introduced a risk-based fee structure for liquor licensing. The annual licensing fees paid by a licensees are now determined based on the assessed risk of each licence. In this way, the costs of liquor regulation are apportioned to licensees on the basis of identified risk factors.

A licensees' annual licensing fee is comprised of a base fee (which varies depending on premises type), as well as any additional fees, which are levied on certain risk factors at licensees.

Policy objectives

Queensland introduced this model in order to:

- provide incentives for licensees to manage licensees consistent with liquor legislation;
- address alcohol-related problems directly, rather than addressing harms after the fact;
- recover the financial costs to government from regulating, preventing and responding to alcohol misuse and abuse; and
- operate a fee structure that is equitable and simple for licensees to understand.

The Queensland Government also intended that the changes would not disproportionately impact regional areas, and that liquor licensing fees would remain competitive with those in other states and territories.

Risk factors

Liquor licensing fees under this model are based on an assessment of four risk criteria: licence type, trading hours, provision of food, and compliance history.

- *Licence type* — the base fee for a liquor licence varies across different licence types, which are: commercial (hotel, casino or other); community (club — large); small club (other); and bottle shops.
- *Trading hours* — licensees that trade extended hours pays a premium for each extended hours period that it operates. 'High risk permits' are needed to trade between 12am–3am, and 'elevated risk permits' between 3am–5am.
- *Food* — there are five levels of risk, with two that apply for off-site sales and businesses where the provision of alcohol is subsidiary to the primary business. The other levels are 'prepared meals' (a meal is prepared on premises), 'prepared snacks' (finger food prepared on premises), or 'no food'.
- *Compliance history* — each licensed premise's compliance history during the last financial year is evaluated. Types of compliance activity, such as warning letters to management, infringement notices, and prosecution or disciplinary action, comprise the scale for risk criteria.

In addition to these risk factors, all new or varied licences must complete and maintain a Risk Assessed Management Plan (RAMP). A RAMP details information relating to a licensee's management practices for matters prescribed in regulation. Information included in a RAMP is the basis for endorsing any conditions on a licence. A RAMP includes information relating to: operating hours; responsible service of alcohol initiatives; security arrangements; provision of food; staff training; lighting; and other factors.

Assessing risk

Licensees self-assess the level of risk for each risk criterion that applies to their operations. Self-assessments are submitted to the Office of Liquor, Gaming and Racing with the commensurate licence fee.

Table F.1 shows the self-assessment table that licensees complete to determine their annual licensing fee. By completing the table themselves, licensees can see how their practices determine their annual licensing fee.

Table F.1

ANNUAL LIQUOR LICENSING FEE SELF-ASSESSMENT TABLE

Criteria	Scale	Risk	Full annual fee	Tick box	Amount
Base fee					
Commercial	Hotel		$2 700		
	Detached Bottle Shop (for each shop)		$3 000		
	Special Facility (5am-12 midnight trading up to 10 outlets; for each extra outlet above 10 add $1000)		$10 000		
	Special Facility (10am-12 midnight trading up to 10 outlets; for each extra outlet above 10 add $1000)		$7 500		

Criteria	Scale	Risk	Full annual fee	Tick box	Amount
	Other		$500		
Community	Club (large >2000 members)		$2 200		
	Club (small <2000 members)		$500		
	Other		$250		
	Subtotal:				
Trading Hours	Please note fees apply to each separate outlet under the licence e.g. detached bottle shops, catering away (regular) areas etc.				
Morning Trading	7am to 9am (clubs by exception – functions allowed)	Low	$1 000		
	7am to 9am (clubs by exception – functions allowed) **(weekends only)**	Low	$750		
	7am to 9am (functions)	Low	$1 000		
	7am to 9am (functions) **(weekends only)**	Low	$750		
	9am to 10am (by exception – for community need)	Low	$500		
	9am to 10am (by exception – for community need) **(weekends only)**	Low	$375		
Ordinary Trading	10am to 12midnight	No	$0		
Late Trading	12am to 3am (general trade)	High	$7 500		
	12am to 3am (general trade) **(weekends only)**	High	$5 625		
	3am to 5am (general trade)	Elevated	$10 000		
	3am to 5am (general trade) **(weekends only)**	Elevated	$7 500		

Criteria	Scale	Risk	Full annual fee	Tick box	Amount
	Subtotal:				
Provision of Meals	Not applicable	No	$0		
	Meals (available up to 2hrs prior to closing)	No	$0		
	No Meals/Meals not available up to 2 hrs prior to closing	High	$1 000		
	Subtotal:				
Compliance History	Positive management history	No	$0		
	Infringement notices	Medium	$5 000		
	Prosecution/ Disciplinary action	Very High	$10 000		
	Major trauma	Encumbrance	$20 000		
	Subtotal:				
	TOTAL ANNUAL FEE				
	TOTAL DUE - 31 JANUARY 2009	**Pay 50% of Annual Fee**			

Source: Office of Liquor, Gaming and Racing (Queensland) 2009d.

Fees

Under this model, liquor licence applicants pay an initial application fee, and existing licensees pay an annual renewal fee. The annual renewal fee is comprised of a base fee, which varies based on licence type, and any risk-based fees that are applicable. The base fee is set at a relatively low level, so as not to significantly impact those premises that have low levels of risk.

The fees levied on licensees through this scheme are intended to cover the direct cost of regulating the liquor industry, and not other costs to government resulting from alcohol-related harm.

F.2 Ontario: risk-based liquor licensing model

Ontario is transitioning towards a risk-based liquor-licensing model through a staged implementation during 2008 and 2009. In contrast with the Queensland model, a licensed premise's level of risk is not the basis for determining licensing fees. Rather, licensees of the same type (such as bar, nightclub etc) pay the same licensing fee, although high-risk premises may be subject to certain conditions to reduce the level of risk.

Policy objectives

Risk-based licensing is supported by four principles. These are:

- to identify persons or places that pose specific risks to public safety or the public interest;
- to lessen any risks and ensure compliance with legislation through the entire cycle of a liquor licence;

- to reduce the administrative burden for those which pose a lower risk, where possible; and
- to focus more regulatory resources on those establishments that pose enhanced risks.

Risk factors

Ontario's risk-based licensing model assesses risk factors in relation to both the licensee or applicant and the premises involved. Those licensee or applicant risks assessed are: past conduct; liquor-related infractions; honesty and integrity; financial responsibility; and training and experience. Those premises risks assessed are: type; location; occupancy; activities; and hours of operation.

Assessing risk

Initial applications for liquor licences are assessed by the Registrar of Alcohol and Gaming using the risk factor criteria.

The Registrar assesses the risks and determines whether the licence should have a designation, and if so, which level (Level I, II or III). If the Registrar considers that no conditions need to be placed on a licence, or that the licensee has taken their own steps to recognise and manage risks, then the Registrar will most likely assess the licence as having no designation. Around 75 per cent of all licences in Ontario are assessed as having no designation.

The Registrar assesses those licensees that need more assistance and support to comply with the liquor legislation as designated at Level I, II or III. About 25 per cent of all liquor licences receive a designation, with most of these being Level I designations. A designation enables the Registrar to attach certain conditions to the liquor licence to help address the risks identified in the assessment.

To help a licensee in Level I, Level II or Level III manage identified risks, certain conditions can be attached to the licence. Some of these conditions require licensees to:

- only sell beverages in containers approved by the Registrar;
- only serve liquor during hours specified by the Registrar; and
- only serve and permit consumption of alcohol outdoors at certain times.[20]

A licensee designated as Level I, Level II or Level III may also be required to submit a plan — such as a safety and security plan, nuisance mitigation plan (covering noise, litter, etc.) or patron control plan — to help them comply with liquor licence laws and protect public safety.

Fees

Liquor licensing fees are not influenced by risk assessment.

[20] A complete list of the conditions that the Registrar may impose on licenses is available at http://www.agco.on.ca/en/b.alcohol/b11.2.conditions.html .

F.3 Greater Geelong: late licensees land rate differential

The City of Greater Geelong applies a 'late licensees land rate differential' ('the rate differential') to those licensees that trade extended hours (after 1am) at least one night per week. The rate differential increases the council rates paid by licensees with extended trading hours, with this additional revenue contributing to the costs of cleaning up vandalism, litter and vomit[21] associated with extended trading. In March 2009, there were 30 venues in Geelong subject to the rate differential.

Policy objectives

The stated objective of the rate differential is to ensure that all rateable land makes an equitable financial contribution to the cost of carrying out the functions of council. This includes the offset of costs (direct and indirect) associated with late night trading. These costs include street sweeping, vandalism, litter collection, and providing a safe taxi rank (City of Greater Geelong 2008).

Risk factors

The sole risk factor considered in the rate differential is a licensed premise's extended trading hours (beyond 1am) at least one night per week.

Assessing risk

The risk is assessed as part of the City of Greater Geelong's annual rating process for all land in the council area. The risk assessment is binary: a licensee either trades past 1am at least one night per week, or it does not. There is no progressive scale of late trading risk.

Fees

A licensed premise subject to the rating differential would pay more than double the annual rates paid by licensees that doesn't trade extended hours. For a property with an assessed value of $500,000, a licensed premise with extended trading hours would pay an additional $2,853 each year above those that would be paid by a licensees with standard trading hours.

Table F.2

LATE LICENCE PREMISES LAND RATE DIFFERENTIAL

Licensees	Rate in dollar	Assessed property value	Rates payable
Standard trading hours	0.004705	$500,000	$2,353
Late licensees land*	0.010412	$500,000	$5,206
Difference in rates payable			**$2,853**

* The classification given to a licensed premise if it supplies alcohol after 1am at least one night per week.
Source: Personal correspondence with the City of Greater Geelong, 17 March 2009.

[21] This has led to the rating differential being referred to as a 'vomit tax' in some media.

F.4 WorkSafe Victoria: risk-based workplace injury insurance

WorkSafe Victoria insures employers for the costs of entitlements paid to workers who are injured or become ill because of their work. In Victoria, all employers that expect to pay more than $7,500 to their workers each year, or employ apprentices or trainees, are required to take out a WorkSafe Injury Insurance policy (WorkSafe Victoria 2009).

As an insurer, WorkSafe estimates the total funding that it will need to meet the cost of project claims and operational costs for future periods. This figure represents the revenue requirement to be met through premiums paid by employers for WorkSafe Injury Insurance policies.

WorkSafe then establishes and applies a formula to determine how much premium each employer should pay for their insurance policy. The amount that each employer contributes is based on several factors, including the employer's size, the nature of its work, its recent experience in workplace injury claims, and any premium caps that may apply.

Policy objectives

WorkSafe Victoria has several objectives that relate to its role as a provider of workplace injury insurance. These include:

- to provide reasonably priced workplace injury insurance to employers
- to help avoid workplace injuries occurring
- to enforce Victoria's occupational health and safety laws
- to manage the workers compensation scheme by ensuring the prompt delivery of appropriate services and adopting prudent financial practices.

Each of these objectives can be linked to WorkSafe's risk-based model of workplace injury insurance. WorkSafe's cost recovery approach to determining premiums is one means of pricing insurance reasonably. Its inclusion of an employer's past experience with workplace injury claims as a determinant of the employer's premiums is one way to help avoid workplace injuries occurring, as employers have a greater incentive to avoid workplace injuries. WorkSafe Victoria (2008, p. 3) summarises its approach as, '... providing a balance of incentive, assistance, persuasion and enforcement'.

Determinants of premiums

WorkSafe uses four factors to determine the insurance premium that an employer is required to contribute.

- *Remuneration* — WorkSafe assesses the size of an employer by the total value of remuneration paid to employees per year. A small employer is classified as one which provides remuneration of less than $200,000 per year, while medium and large employers provide remuneration above this amount.

- *Workplace industry classification* — a workplace can be classified as operating in one of more than 500 different industry classifications, based on its principal business activity. WorkSafe calculates a risk premium rate for each industry based on its records of the claims experience of all employers in the classification. Those industry classifications that involve high-risk activities, such as concreting or abattoirs, are more likely to have claims. As a result, WorkSafe applies a higher rate to these industries.
- *Employer claims experience* — the premium that a medium or large employer pays depends on the employer's recent injury claims experience. WorkSafe compares the cost of an employer's recent injury claims with those of the employer's industry classification. If the employer's claims experience is more favourable than those of its peers, the employer pays below the industry's rate. Claims experience is not considered for small employers.
- *Premium capping* — WorkSafe applies a capping system on premiums to protect employers from dramatic variations in their premiums from year to year. For those employers that enter into a new policy period in the same industry classification, WorkSafe will not increase their premium by more than 30 per cent from the previous policy period.[22]

Assessing risk

As the previous discussion outlined, WorkSafe controls some aspects of risk assessment, while employers undertake others.

WorkSafe draws on its records to determine the risk premium rates for industry classifications, and employers' claims experience. WorkSafe also applies its premium capping system as required.

Employers, however, self-assess in relation to two of the premium determinants. In relation to remuneration, employers self-assess and report this to WorkSafe. Employers also nominate their principal business activity for the workplace industry classification. It is the employer's responsibility to advise WorkSafe of any changes to their principal business activity, as this may impact on their workplace industry classification. WorkSafe undertakes audits of employers to ensure the accuracy of the information provided by employers. Employers can also request WorkSafe to undertake a premium review if they consider their premium is incorrect.

Fees

The average premium amount is around 1.287 per cent of remuneration across the state.

There is a range of payment options. Employers with a premium less than $1000 are required to pay the amount in full each year. Premiums can be paid monthly or quarterly, with a 3 per cent discount applying to those who pay annually in advance.

[22] This is subject to WorkSafe's minimum capping factor, which is described at http://www.worksafe.vic.gov.au/wps/wcm/connect/WorkSafe/Home/Insurance+and+Premiums/Calculating+Premiums/.

Appendix G

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