I The link between accessibility and gambling harms

I.1 Introduction

Many studies have argued that increases in accessibility (or availability of, or exposure to) gaming machines and other forms of gambling have led to increased participation and more gambling problems.

> Hundreds of articles in the gambling literature, typically in introductory paragraphs, assert the availability-problem link. [Electronic gaming machines] are frequently highlighted as the gambling form most strongly implicated in the development of problem gambling. In this regard, they have been referred to as the 'crack-cocaine' of gambling … Major reviews (eg Shaffer, Hall and Vander Bilt 1997, Wildman 1998, Abbott and Volberg 1999) have, with varying degrees of qualification, concluded that research findings are generally consistent with the view that increased availability leads to more gambling and problem gambling. National official review bodies in Australia (Productivity Commission 1999), the USA (National Research Council 1999) and the UK (Gambling Review Body 2001) have reached the same conclusion. (Abbott 2006, p. 3)

The existence and strength of any link between the accessibility of gaming machines and gambling harms is relevant to the desirability of any regulations that limit such accessibility.

This appendix sets out some of the key aspects of that link, the challenges in determining it empirically, and some of the empirical findings from the literature.

I.2 Some methodological issues

There are many dimensions of accessibility

Accessibility has many different dimensions, including the:

- number of opportunities to gamble in a particular form (for example, the number of TAB outlets, casino tables and gaming machines)

- number of gaming machines or gambling venues per adult in an area
- spatial distribution of gaming machines within a given jurisdiction (destination gambling as in Western Australia, or widely dispersed community gambling, as in other jurisdictions) or within regions or local areas (for example, whether machines are clustered or spread out, and are close to shopping centres, parking, transport hubs or housing). The spatial distribution will determine the level of transport costs (depending on time, distance, public transport, and parking availability) to access gaming venues, and also the general visibility of gaming in an area. (Some of the complexities associated with measuring accessibility at the local level are discussed in box I.1.)
- role of the venues themselves, and in particular their wider social and commercial roles. For instance, hotels and clubs are customary places for people to socialise, have a drink and a meal, and to enjoy a variety of entertainments. Accordingly, people are often going to these destinations for reasons additional to gambling. This has several potential effects. It means that the incremental costs of accessing gaming are lower than transport costs to the venue might imply since people already will be going to these venues for other reasons. In addition, it leads to what some have called 'psychological' accessibility — making gaming more familiar and normalised for people — and increasing gambling expenditure
- internal layout of venues, such as the visibility and location of the gaming room, ATMs, and note breakers in relation to other areas of the venues
- number of opportunities to gamble in a venue, such as the number of gaming machines in a venue
- opening hours of a venue and any other factors that may influence the capacity of a gambler to play for longer (for instance, the absence or presence of features that may lead to breaks in play — such as a requirement to go outside to smoke)
- conditions of entry, such as dress codes or minimum age restrictions
- ease of use of the gambling form, such as whether skill is required
- initial outlay or cost of gambling, such as the initial stake in a game of poker or associated with acquiring the appropriate online technology
- degree of social accessibility, including the extent to which a venue provides a non-threatening and attractive environment to persons who might otherwise feel excluded.

Some dimensions may be more closely associated with gambling harms (or indeed, positive impacts) than others. For example, Thomas referred to recent research (Moore et al. 2008; Thomas et al. 2009) that suggests that 'geographic and temporal

aspects of accessibility' are significantly and positively related to severity of gambling behaviour whereas 'social and personal aspects of accessibility' are at best only weakly related (sub. DR316, p. 1). In addition, since gamblers are a very diverse group, some dimensions may have more adverse impacts for particular sub-groups, but not for others.

Box I.1 **Accessibility at the local level is changing and complex**

In her submission to this inquiry, McMillen noted many of the complex and dynamic aspects of accessibility at the local area level, and some of the methods that can be used to measure these. In her research using GIS techniques (geographical information system) she found that:

- in all localities studied, the 'fit' and interaction between venues and their local communities had altered significantly since the venues were licensed
- gambling behaviour, policy impacts, community harm and wellbeing varied from one locality to another
- communities were not confined by official geographical boundaries (local government areas or statistical local areas)
- communities were not static or passive
- travel patterns by patrons to venues varied within and between communities
- leakage of gaming machine patrons and expenditure and the 'sponge city' phenomenon occurred in some localities, but not others.

Source: sub. 223, p. 10.

Causal links are complex

A further challenge is that, at the small area level (such as local government areas or postcodes), the causal links between accessibility and gambling are likely to be multi-directional and hard to disentangle.

Higher densities of gaming machines in an area are likely to create more problem gambling.

However, gaming machines will tend to be supplied to areas where demand is greatest — which will be areas where people have a higher propensity to play gaming machines frequently and where problem gamblers are more common. In that case, the direction of causality would partly run from the characteristics of the population that lead to greater play (people's age, education, job type, ethnicity and

income), to problem gambling rates, to the intensity of demand, and, finally, to machine density rates — or the reverse of the causal pathway usually supposed.

There is evidence that at least some of the relationship between problem gambling rates and density would reflect such demand differences:

- For example, the 2005-06 South Australian prevalence study shows gambling participation rates vary across people with different traits. Higher usage groups were people aged 18–24 years, those with no young children and those with only a secondary level of education.[1] Data from the 2006 New South Wales gambling prevalence survey (AC Nielsen 2007, pp. 67–8) also suggested that males aged 18 to 34 are over-represented in the problem gambling group. The effects of accessibility may also vary with the socio-economic background and vulnerability of the exposed populations. For example, one group at risk of problem gambling is regular gamblers on low incomes — data from McDonnell-Phillips (2006, p. 91) showed that regular gamblers (TAB punters and gaming machine players) with an income between $20 800 and $25 999 spent between 19 and 24 per cent of their income compared with regular gamblers within an income bracket of $52 000 to 62 399 who spent 3 per cent of their income. (However, differing levels of disadvantage in local areas do not seem to be systematically associated with expenditure on gaming machines — box I.2.)
- It is known that populations in different areas have different mixes of these socio-economic characteristics (as revealed by social atlases produced by the Australian Bureau of Statistics[2]), which would lead to greater problem gambling rates in some areas.
- The resulting variations in demand, would, all other things being equal, lead to greater gaming machine densities in those areas.

The presence of 'reverse causality' leads to the potential for endogeneity bias, which means that parameter estimates for the link between accessibility and problem gambling rates or other harms may be biased.

Saturation effects

While there is good evidence of a link between accessibility and problems, a key question is whether the *marginal* effects of increases in accessibility are constant as accessibility rises, or whether there may be a non-linear relationship. In particular, once gaming machine density has achieved a particular level, so that additional

1 Office for Problem Gambling (2006).

2 ABS (Complete Set of Social Atlases, 2006, Cat. no. 2030.0).

machines are increasingly underutilised, then the link between numbers of machines and harm may be weakened. This would have the implication that, where saturation was present, small regulated reductions in machine numbers could be expected to have only small impacts.

Box I.2 **Socio-economic characteristics of local areas**

Using data for over 170 local government areas in New South Wales for the years 1996-97 and 2001-02, Stubbs and Storer (2003) found that areas with lower social and economic advantage (as measured by SEIFA — socio-economic indexes for areas) were weakly correlated with a higher level of gaming machine density, but not with gaming machine spending per adult (pp. 13, 19).

McMillen and Doran (2006) used GIS to compare the spatial distribution of social disadvantage in three Victorian local government areas (Maribyrnong, Central Melbourne and Greater Geelong) with the spatial distribution of venues and patterns of concentrated gaming machine expenditure between 2001 and 2005. Their analysis showed no direct or uniform relationship between gaming machine expenditure patterns, SEIFA and the density of gaming machines (p. 21).

In contrast with the above two studies, Diamond (2009a) found that the average daily per capita expenditure was higher for more disadvantaged local government areas (such as Central Goldfields, Greater Dandenong and Strathbogie) than for less disadvantaged areas (such as Bayside, Borrondara and Yarra) (p. 7).

Exposure and adaptation theories

In addition, it is also possible that, for a given number of machines per capita, the marginal effects change over time (chapter 4). This could arise because the initial adverse impacts of a sudden substantial increase in accessibility of gaming machines — as occurred in the 1990s in many jurisdictions — would be experienced by a large group of previously unexposed population groups.

After that initial exposure, the marginal effect could decline as:

- the novelty of gaming machines waned, reducing participation rates and general exposure
- people who had developed problems resolved them
- society and regulatory settings adapted to the risks.

For example, Abbott (2006, p. 6) hypothesised that over time, years rather than decades, adaptation ('host' immunity and protective environmental changes such as reduced novelty in gambling and increased public awareness of problem gambling)

typically occurs and problem gambling levels stabilise or reduce, even in the face of increasing exposure.

Problem gambling would still be expected to occur as young people became adults (acquiring the right to play gaming machines), with influxes of migrants, and as people in the general population developed vulnerabilities to gambling problems. Further, changes in technology — for example, increases in intensity of play and, new game features — could be expected to lead to re-exposure of the whole adult population to new variants of gaming machines.

I.3 Geographical accessibility

The empirical relationship between various measures of accessibility and various gambling outcomes (expenditure, use of help services, problem gambling) has been a focus of considerable Australian and overseas research.

Density and expenditure are related

While the key policy-relevant relationship is between accessibility and harm, the relationship between accessibility and expenditure is also useful for understanding the impacts of the greater availability of gaming machines.

In its 1999 report, the Commission generally found a close relationship between gaming machines per 1000 adults (density) at the jurisdictional level (one dimension of accessibility) and gaming machine expenditure per adult (PC 1999, p. 8.10). The relationship reflected the plausible assumption that high levels of demand (and expenditure) led to high levels of supply of machines, which in turn had a positive feedback effect on demand (and expenditure).

The Commission re-examined the strength of the relationship using recent Australian Gambling Statistics data for 2006-07 across the jurisdictions (figure I.1). As expected, there is a positive relationship between gaming machine density and gambling expenditure per adult, which appears to have remained stable since 1999.[3]

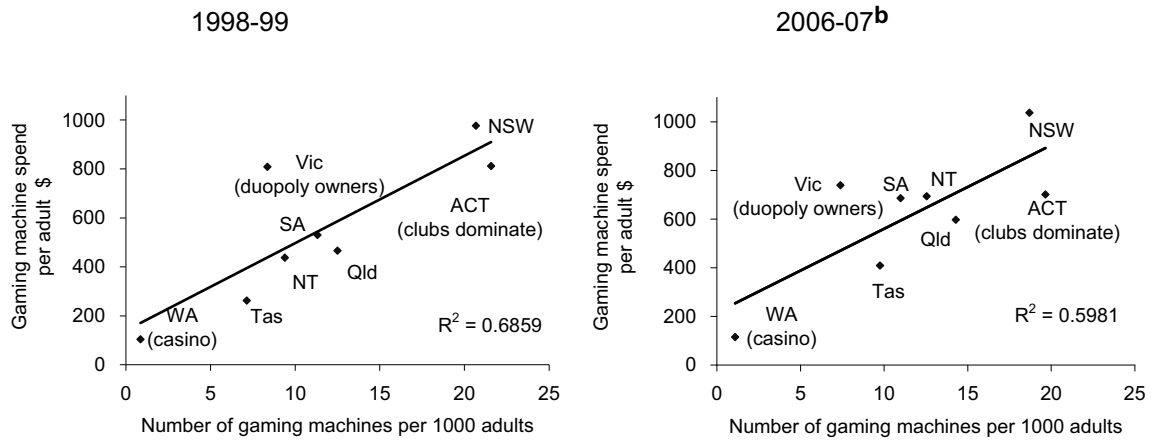
The 2006-07 data show that Victoria has a higher level of gaming machine expenditure per adult than might be predicted given its gaming machine density. This is likely to reflect the duopoly arrangements and the binding cap applying at the time the data were collected.

[3] The possibility of structural change was investigated statistically. However, it is notable that as the variations in expenditure across jurisdictions accounted for by variations in density has fallen — the relationship is less reliable. That makes it harder to be sure whether there has, or has not been, structural change, and also means that other factors also determine expenditure.

The relationship was also re-estimated using 2008-09 data, largely provided by gambling regulators (figure I.2). Unlike the data in figure I.1, this data include the number and expenditure of gaming machines in casinos (rather than an estimate). The newer data show that the relationship is still positive and appears to be possibly weaker than what it was in 1998-99 and 2006–07 — however, it is not possible to be conclusive of this as the data in figure I.1 are drawn from a different source.

Several other studies have also found a strong association at the local area level between the gaming machine density and gaming machine expenditure (or revenue) per adult using local government area or statistical local area data (box I.3). However, given the high level of disaggregation, these estimates are more prone to potential endogeneity biases than aggregate studies, so the link between density and spending may partly reflect the fact that clubs and hotels are more likely to invest in gaming machines in suburban or local government areas where there is higher demand.

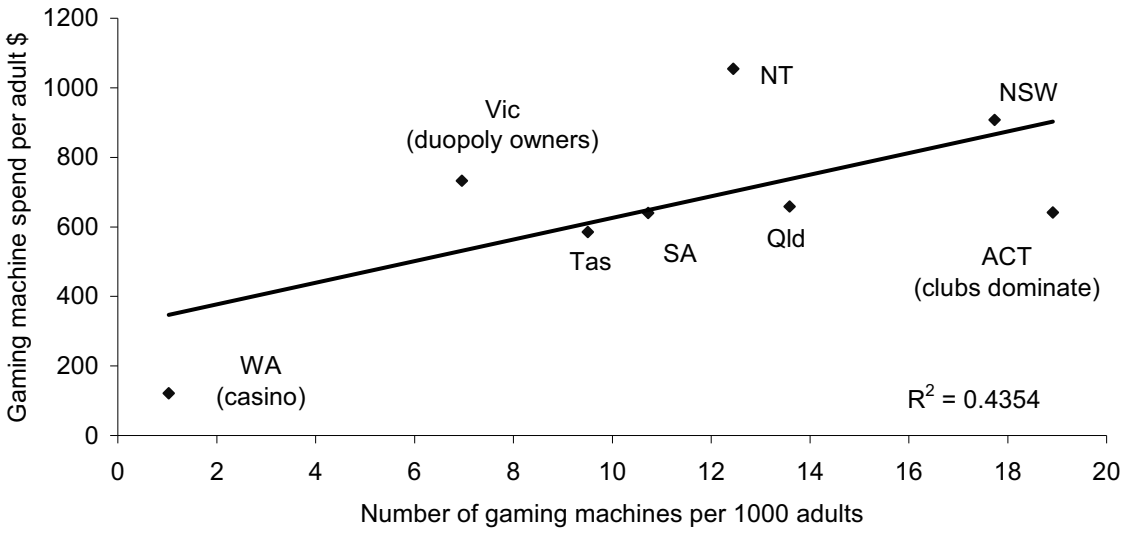
Figure I.1 **The link between real gaming machine spending and numbers of machines, all venues**[a]



[a] Applies to clubs, hotels and casinos in each jurisdiction. Expenditure is in 2006-07 values. As gaming machine expenditure in casinos is not separately reported in the Australian Gambling Statistics it was estimated. Using ABS data (Casinos 2000-01, Cat no. 8683), the share of gaming machine net takings in total gambling takings for casinos was applied to real casino expenditure reported in the Australian Gambling Statistics for each jurisdiction to obtain estimated real gaming machine expenditure in casinos. The shares used were 39.1 per cent for 1998-99 and 40.8 per cent for 2006-07. [b] Although more recent data are available than 2006-07 on the number of gaming machines and gaming machine expenditure in some jurisdictions, data from the 2008 25th edition of Australian Gambling Statistics are used to ensure as much consistency in the data over the two time periods as possible.

Data sources: Office of Economic and Statistical Research (2008) — number of gaming machines, real expenditure on gaming machines in hotels and clubs, real casino expenditure in 2006-07; ABS (Population by Age and Sex, Cat no. 3201, accessed by DX) — adult population in each jurisdiction in 1998-99 and 2006-07; ABS (Casinos 2000-01, Cat no. 8683.0) — gaming machine and total gambling net takings in 1998-99 and 2000-01.

Figure I.2 **The link between gaming machine spending and number of machines, all venues, 2008-09**[a b]



a Applies to clubs, hotels and casinos in each jurisdiction. **b** The position of jurisdictions in this figure, particularly the Northern Territory, may not entirely coincide with their position in figure I.1. This is probably due to the ratios used in figure I.1 and derived from ABS data to estimated gaming machine expenditure in casinos. For example, in the Northern Territory, the actual share of gaming machine expenditure in casino expenditure in 2006-07 was around 76 per cent, compared with the estimated share of 41 per cent applied to casino expenditure in all jurisdictions in figure I.1.

Data sources: ABS (Population by Age and Sex, Cat no. 3201, accessed by DX) — adult population in each jurisdiction in 2008-09; chapter 2, table 2.7 — gaming machine expenditure in each jurisdiction in 2008-09; chapter 2, table 2.11 — number of gaming machines operating in each jurisdiction in 2008-09.

One of the key underlying mechanisms by which density could affect spending is proximity to venues with gaming. The evidence suggests that proximity is an important determinant of demand (box I.3).

Links between geographical accessibility and harm

The Commission's 1999 findings

In its 1999 report, the Commission examined the association between various dimensions of accessibility and problem gambling prevalence rates (measured by SOGS 5+) across the jurisdictions drawn from its national gambling survey (PC 1999, pp. 8.8–8.15). It found:

- There was a statistically significant positive relationship between gaming machine density and the problem gambling prevalence rate (pp. 8.8–8.9).

- Problem gambling prevalence rates were generally higher in jurisdictions with higher (non-lottery) gambling expenditure per adult. New South Wales, for example, had consistently high levels of problem gambling than other states, and Western Australia — where gaming machines were effectively barred in community venues, as they are now — had a much lower level (p. 8.10).
- The variation in gambling expenditure per adult (p. 8.11) explained about 60 per cent of the variation in problem gambling prevalence rates across jurisdictions.
- There were links between liberalisation of gambling and changes over time in problem gambling (such as in the use of help services) and in the feminisation of problem gambling.

It should be noted that the above approaches reduce the problem of reverse causality. This is because the socio-demographic variations between whole jurisdictions are modest compared with the differences that arise at the small area level. Similarly, the results from the time series analysis is less likely to be affected by the problem of reverse causality.

Box I.3 **Associations between spending and density at the local area level**

Delfabbro (2002) used statistical local area data to examine the distribution of gaming machines and gambling-related harm in the Adelaide metropolitan area. He found a very high correlation between gaming machine density and net revenue (p. 100). (He also found a high correlation between gaming machine density and the proportion of the population who had sought help from treatment services.)

Stubbs and Storer (2003, 2005 and 2007) examined the relationship between gaming machine density and expenditure per adult using New South Wales local government area data. For example, Storer and Stubbs (2007) found that the relationship between gaming machine density and dollars spent per adult on gaming machines was very strong, and that it persisted over the period from 1996-97 to 2005-06 (p. 7). Based on 2005-06 data, they estimated that variation in the density of gaming machines accounted for 77 per cent of the variation in gambling machine expenditure per adult.

Diamond (2009a) estimated a model to forecast gambling expenditure in 52 Victorian local government areas using time series data from 2003 to 2007. He found that average daily per capita expenditure was higher for local government areas with a high concentration of gaming machines (for example, Melbourne, Maribrynong and LaTrobe) than for areas with a low concentration of gaming machines (for example, Boroondara, Bayside and Nillumbik) (p. 7).

Box I.4 **Proximity to venues**

Marshall (2002, cited in Delfabbro 2008a, p. 172) found that people in New South Wales living within 500 metres of a club were more likely to gamble than those who lived further away.

In their 2003 Victorian gambling prevalence survey, the Centre for Gambling Research (2004a) found that 57 per cent of Victorians travelled less than five kilometres to gamble and that 32 per cent travelled less than 2.5 kilometres (p. 81).

In a study of 2447 residents in the Tuggeranong Valley in the ACT, Marshall, McMillen, Niemeyer and Doran (2004) found that people who lived close to a club (less than 3.5 kilometres) tended to spend more on gambling than those who lived further away (p. 11). They also found that clubs outside the Tuggeranong Valley attracted many regular patrons among Tuggeranong residents (p. 9).

Data from the 2007 Tasmanian prevalence study showed that over 40 per cent of Tasmanians reported travelling 0–5 kilometres to visit a gaming venue, just under one in five travelled 6–10 kilometres, and a third said that they travelled over 10 kilometres (SACES 2008a, p. 212). When asked whether they usually gambled at the venue closest to their home, 42 per cent of gaming machine players said 'yes', whereas 56 per cent said 'no' (p. 212).

The Ministry of Health (New Zealand) (2008b), from an analysis of the 2002-03 New Zealand Health Survey involving around 12 500 respondents aged 15 years and over, found that:

- compared with those who lived in neighbourhoods furthest from gambling venues, people who lived in neighbourhoods closer to gambling venues were significantly more likely to: have gambled at a gambling venue in the last year; or be a problem gambler who had gambled at a gambling venue in the last year
- people who lived in a neighbourhood closer to a non-casino gaming machine venue were significantly more likely to: have gambled on a non-casino gaming machine in the last year; or be a problem gambler who had gambled on a non-casino gaming machine in the last year
- gambling behaviour was more strongly associated with the distance to the nearest gambling venue, than with the number of gambling venues within walking distance
- the more gambling venues there were within 5 kilometres of a person's neighbourhood centre, the more likely it was that the person had gambled at a gambling venue in the last year
- if people had at least some non-casino gaming machines within 800 metres of their neighbourhood centre, they were more likely to have gambled on an non-casino gaming machine in the last year (p. x).

In a study of the gambling behaviour of 533 hotel and club staff, Hing and Nisbett (2009, table 8.3) found that, of those who played gaming machines, 84 per cent travelled less than 5 kilometres and 64 per cent travelled less than 2.5 kilometres to gamble.

Subsequent Australasian research

In his analysis of the Commission's findings, and incorporating relevant New Zealand data, Abbott (2006) suggested a non-linear relationship between gaming machine densities/gaming machine expenditure per adult and problem gambling prevalence rates (p. 10), with the link weakening above a threshold of spending and machine density. Abbott speculated that the relationship broke down at somewhere between six and 10 gaming machines per 1000 adults and where annual gaming machine expenditure per adult reached about $200 (in 2006 dollars) (pp. 10–11).[4]

However, subsequent research based on a meta-analysis of the prevalence rates from 34 problem gambling surveys undertaken in Australia and New Zealand since 1991 found a linear relationship, with no threshold effects (Storer, Abbott and Stubbs 2009). The prevalence of problem gamblers (SOGS 5+) increased at around 0.8 problem gamblers for each additional gaming machine introduced (p. 9). The authors concluded that these findings indicated that 'policies related to restricting or reducing the density of [gaming machines] are likely to play a significant role in containing or reducing gambling-related harms' (p. 11–12).

The study also found that the effect of accessibility appeared to reduce over time, with the prevalence rate falling by an average 0.09 per cent annually for a *given* gaming machine density. The authors concluded that, while this was partially consistent with the adaptation thesis (discussed above), the decrease in prevalence over time was a complex matter, with a range of possible explanations (pp. 11, 12).

Areas with low gaming machine density appeared to show greater variations in prevalence (p. 9). The authors considered that this may reflect the importance of clustering of licensed venues and gaming machines in particular localities, or variations in the nature of venues themselves (p. 12).[5]

The link between gaming machine density and problem gambling prevalence rates has also been found for Queensland using the 2005 and 2007 prevalence surveys (Judith Stubbs and Associates sub. 73, pp. 6–7). Among their findings were:

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4 Abbott also re-examined the 'outlier' cases of Victoria and the Northern Territory (2006, p. 10). Compared with other jurisdictions in 1999, Victoria had a problem gambling prevalence rate that was relatively high, but a low gaming machine density, and the Northern Territory had low gaming machine expenditure per adult, but a relatively high problem gambling prevalence rate. He supported the Commission's view in 1999 that the Victorian case reflected the imposition of a long-standing cap and that the Northern Territory case reflected high levels of expenditure per adult on casino and track betting.

5 Judith Stubbs and Associates also noted that this was in line with findings from their analysis of time series data across New South Wales local government areas for the 2007 New South Wales Statutory Review of the Gaming Machines Act 2001 (sub. 73, p. 6).

- for the combined data set, an additional gaming machine placed into a local government area resulted in an additional 0.3 problem gamblers (CPGI). Based on a 'crude transformation' to the SOGS 5+ criterion for problem gambling, this appeared to be similar to the findings of the meta-analysis above, although less significant. They found no apparent threshold effects and no apparent change in the relationship over time (unlike the study above)
- while there appears to be a relationship between problem gambling prevalence and the density of gaming machines, such a relationship was not apparent for low or moderate risk gamblers (p. 7).

In another study, the Ministry of Health (New Zealand) (2008b) found from an analysis of the 2002-03 New Zealand Health Survey involving around 12 500 respondents aged 15 years and over that, compared with those who lived in neighbourhoods furthest from gambling venues (or non-casino gaming machine venues), people who lived in neighbourhoods closer to gambling venues (or non-casino gaming machine venues) were significantly likely to be a problem gambler who had gambled at a gambling venue (or non-casino gaming machine venues) in the last year (box I.4).

International research

Evidence from other countries also provides empirical support for a link between accessibility and harm:

- Welte et al. (2004) undertook a national US telephone survey of 2631 adults and found a positive link between proximity to a casino (less than 10 miles) and problem gambling prevalence rates (p. 421).
- Ladouceur et al. (2005) undertook a study involving a focus group of 99 adults in Quebec to examine the relationship between the availability of gaming machines outside of casinos and problem gambling prevalence rates to assess whether concentrating machines in fewer venues could reduce problem gambling prevalence rates. Problem gamblers reported a preference for this restriction (p. 144). However, occasional and at-risk gamblers were undecided (p. 144). The quantitative and experimental second stage of the project confirmed this finding, with 77 per cent of respondents agreeing that concentrating machines would better control the negative effects associated with gaming machine (p. 150).
- Rush et al. (2007) mapped exposure to gambling opportunities and accessibility of treatment against problem gambling prevalence rates in Ontario. They found problem gambling appears to be modestly, but significantly, associated with proximity to casinos and race-tracks with gaming machines (p. 8).

- Lund (2009) undertook a panel study of around 1300 gaming machine players in Norway over two waves during 2007 to examine the effects of a temporary ban introduced between 2007 and 2008. Wave 1 was conducted before the ban, with wave 2 conducted after the ban. Lund found that reductions in gambling participation, frequencies and problems following the ban, in particular:
  - gambling participation by wave 1 high intensity and at-risk players reduced from 100 per cent and 90.6 per cent, respectively, to 15.3 per cent and 18.7 per cent, respectively (p. 220)[6]
  - gambling frequencies for wave 1 high intensity and at-risk players reduced by 11.8 per cent 18.5 per cent, respectively (p. 221)
  - problem gambling prevalence at wave 1 was 1.2 per cent compared with 0.3 per cent at wave 2 (p. 219). [7]

In contrast to these studies are two large-scale studies by Sevigny et al. (2008), which examined the relationship between casino proximity and problem gambling prevalence rates. The first study based on a sample of 8842 participants from Quebec found a positive link between casino proximity and gambling participation and expenditure, but no link with the problem gambling prevalence rate (p. 297). The second study, based on a sample of 5158 participants from Montreal, found a positive link between casino proximity and gambling participation, but not with expenditure or the problem gambling prevalence rate (p. 299). The authors concluded that casino proximity itself does not appear to explain the problem gambling prevalence rate.

I.4 Problem gambling prevalence amongst venue staff

One group has a high degree of routine accessibility to gambling — the employees of gambling venues.

Hing and Nisbett (2009) examined the link between gambling accessibility and problem gambling prevalence for over 500 staff in Victorian hotels and clubs. Among other things, the authors compared the gambling behaviour and problem gambling prevalence of staff to that of the general Victorian population (as

6 Lund suggests that the continued participation of play of gaming machines following the ban arises due to the availability of gaming machines in neighbouring countries, and that many people live quite close to the Norwegian border.

7 Lund also found that there was no indication of the development of an illegal gaming machine market, or of significant substitution of gaming machines with other types of gambling, including on the internet (p. 222).

measured by the Centre for Gambling Studies 2004b). Notably, the problem gambling prevalence rate (CPGI status) for venue staff for all forms of gambling was 5.6 per cent compared with 0.97 per cent for the Victorian population (table I.1).

The authors also analysed the influence of three summary measures of perceived accessibility[8] — social access (for example, family and peer approval), physical access (for example, convenience) and cognitive access (for example, an understanding of how gambling works) — on the CPGI status of venue staff. In relation to staff who played gaming machines, the authors found that:

- there was a significant association between social access and cognitive access — but not physical access — and CPGI status (2009, table 9.33)
- the probability of staff being a moderate risk or problem gambler increased as cognitive access became easier and as social access became more difficult (2009, tables 9.34 and 9.35).

Although the study set out to examine the impact of accessibility on venue staff, its findings are more consistent with gambling being a relatively normalised activity for venue staff compared with other population groups.

Table I.1 **Victorian venue staff compared with the Victorian population: gambling behaviour in relation to gaming machines**

	All venue staff (2007)	*Victorian population (2003)*
Gambling participation	77.3%	33.5%
	(n=533)	(n=8479)
Gambled 1 to 3 times a week	19.9%	7.6%
	(n=412)	(n=2840)
Gambled more than 3 times a week	3.4%	0.9%
	(n=412)	(n=2840)
Travelled 5 km or less to gamble.	83.9%	57.3%
	(n=412)	(n=177)
Prevalence of moderate risk gamblers[a] — all gambling forms	13.7% (n=533)	0.91 (n=141)
Prevalence of problem gamblers[a] — all gambling forms	5.6% (n=533)	0.97% (n=141)

[a] CPGI status.

Source: Hing and Nisbett (2009, tables 8.1, 8.2, 8.3, 8.4).

8 The authors attempted to capture various dimensions of accessibility through the construction of 'access scales' based on 13 access questions for each of six forms of gambling, including gaming machines (2009, pp. 118–9).

I.5 Summing up

The results support a link between gaming machine density and problem gambling prevalence rates. The aggregate and time series studies suggest that accessibility is *causally-related* to problem gambling. However, for small area studies, the relative strengths of the two links between accessibility and harm has not yet been considered rigorously.

- On the one hand, greater accessibility stimulates demand, with the result that some gamblers are exposed to risks that were originally muted or not present.
- On the other hand, a population that already includes problem gamblers will be typified by higher expenditure levels (chapter 4), encouraging greater supply of gaming machines in those areas. To the extent that this is the case, reducing accessibility in that area may result in greater utilisation of existing machines or shifts in the location of demand, without reducing harm.

It is probable that both effects are present in such local area studies, with the relative size of the two competing effects likely to depend on the pre-existing level of accessibility and the nature of the host communities. It is likely that the second effect is dominant once accessibility rises above a certain threshold. Analysis of longitudinal data on problem gambling and accessibility may help better identify the relative strengths of the two causal pathways.

The empirical analysis of the links between other dimensions of accessibility and problem gambling is still in its infancy (reflecting the complexities of such analysis — as suggested by the research of McMillen in box I.1).