Gambling as a public health issue: The critical role of the local environment

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Abstract

This paper discusses gambling as a public health concern and outlines why local circumstances are central to such concerns. Using the framework of compositional and contextual factors to frame discussions, it is argued that the local circumstances of individuals and communities are critical to whether gambling activity is problematic. Unlike other similar public health issues for which there are clear parameters defining what is a problem and how severe the problem is, it is argued here that gambling-related problems are determined almost entirely by the circumstances in which the activity is occurring. As such, strategies designed to prevent or minimise gambling-related problems should target the local contextual environment and not just focus on the gamblers themselves, as has tended to occur to date.

Keywords: gambling, problem gambling, public health, contextual, compositional, local environment

Introduction

In Australia and indeed worldwide, gambling activity has reached unprecedented levels. Total annual gambling expenditure in Australia now exceeds A$17.5 billion (Office of Economic and Statistical Research, 2007). As a percentage of household disposable income, gambling increased from 1.5% in 1980/81 to 3.0% in 2005/06 (Office of Economic and Statistical Research, 2007). Many other jurisdictions are also following this trend (e.g., New Zealand, Britain, some parts of Canada and the United States). Public casinos operate in all Australian capital cities as well as in other large urban areas. Electronic gaming machines (EGMs) (gambling devices similar to fruit machines and slot machines) are permitted in hotels and clubs in all states and territories except Western Australia. These machines offer very high intensity gambling with high speeds, high stakes, and large prizes. Because of their omnipresence and simplicity and the attraction of large jackpots, EGMs operating in clubs and pubs now dominate the Australian gambling landscape, accounting for well over half of all gambling revenue nationwide. EGMs have also been the gambling format most closely associated with gambling-related problems.

With such unprecedented growth, the effects of gambling are coming under intense public, political, and academic scrutiny. In particular, the issue of problem gambling has been the most focussed upon. Although much debate surrounds how to define, measure, and understand problem gambling, for the purposes of this paper, the following definition is used: 'Problem gambling is characterised by difficulties in

limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community' (Neal, Delfabbro, & O'Neil, 2005).

In addition, concern has also been expressed about the economic, social, cultural, moral, and political implications of widespread availability and consumption of gambling. As such, a wide range of academic disciplines have sought to examine gambling from their particular perspective. Only recently has gambling fallen into the scope of geographers (e.g., Marshall, 2002) and just as recently into the domain of public health (e.g., Korn & Shaffer, 1999; Productivity Commission, 1999). As Raento and Berry (1999) highlight, the study of gambling is an area which can benefit enormously from the rich methods such researchers now have at their disposal. In particular, given the emerging evidence of a link between the growing accessibility of gambling products and increases in problem gambling and related public health concerns, there is great potential to exploit recent advances in geographical and public health approaches to better understand the consequences of widespread gambling proliferation. Identifying how, where, and in what format public health implications of gambling occur and formulating policy to address the emerging concerns are clear avenues for investigation.

Indeed, one of the key reasons supporting the argument that gambling problems need to be addressed from a public health and geographical perspective is that certain areas and population groups appear to exhibit higher levels of gambling activity than do other areas. Numerous authors (e.g., Doughney & Kelleher, 1999; Livingstone, 2001; Marshall, 1999; Marshall & Baker, 2001a, 2001b, 2002; Productivity Commission, 1999; Ministry of Health, 2008) have pointed to the higher per capita expenditure on gaming machines in suburbs which have higher per capita concentrations of the machines. As such, it has been argued that gambling-related problems will also reflect vast regional variations (e.g., Hames Sharley, 1997; Marshall, 1998, 2005; Marshall & Baker, 2001a, 2001b; Melbourne Institute of Applied Economic and Social Research, Deakin Human Services Australia, & National Institute of Economic and Industry Research, 1997; Productivity Commission, 1999; Wheeler, Rigby, & Huriwai, 2006), although this link is not yet well established. Such findings parallel those in other public health areas, with epidemiological studies of a wide variety of other public health issues finding residents of certain neighbourhoods disproportionately affected. Cohen et al. (2000) cite a multitude of examples.

Despite the recognition of widespread and sometimes vast spatial variations in gambling activity and associated problems, and the recognition of gambling as an emerging public health concern, few attempts have been made to understand such issues within a public health framework. In an effort to better conceptualise gambling as a public health issue, this paper first outlines gambling's credentials as a public health concern, before discussing the critical influence of local circumstances on emergent problems. Using the concepts of contextual and compositional influences to guide the discussion, the paper outlines why public health issues of gambling are more contingent upon local circumstances than are other similar public health concerns and discusses how the relationship between gambling problems and local circumstances can be understood.

Gambling as a public health issue

A wide range of gambling-related public health issues have been identified. In particular, the prevalence of problem gambling for individuals — which is reported to affect between 1% and 3% of the population in Australia (Productivity Commission 1999, p. 2) — has become a major focus. As is implied by the definition of problem gambling adopted earlier in this paper, implications of problem gambling include concerns for individual gamblers, as well as for those affected by gamblers (Korn, 2002). This is because some gamblers participate in the activity to an extent that it disrupts their families and employment situation (Productivity Commission, 1999, pp. 734–735; Walker, 1996, p. 223). At an individual level, family dysfunction and domestic violence, alcohol and drug problems, psychiatric conditions, and suicide are all traditional public health issues which have recently been linked to gambling (Korn & Shaffer, 1999, p. 323). One Australian study found that persons experiencing gambling-related problems also have higher rates of poor to fair general health, greater levels of smoking and alcohol use, more mental health concerns, and increased psychological distress than is evident amongst the wider population (Centre for Population Studies in Epidemiology, 2001, p. 9). A national inquiry into Australia's gambling industries conducted at the request of the Federal Government concluded that emotional distress, depression, suicide, and counselling for problem gamblers, as well as for their friends and families, all appear to be of a magnitude to warrant serious policy attention (Productivity Commission, 1999, pp. 9.11–9.15). Although findings of gambling problem comorbidity with a variety of other health problems are increasingly common, the relationships are complex and to date have not been explored in great detail.

There appears little doubt then that gambling is an issue which should be of interest as a public health concern. Not only are there direct health and well-being implications associated with problem gambling but there is also evidence of indirect consequences for gamblers and their friends, families, and communities. However, certain factors render gambling different from other public health concerns. Primarily, gambling is not an issue that fits neatly into traditional health-related discourse. Although in its most extreme form, understanding of problem gambling has been medicalised as an addiction (Wheeler et al., 2006, p. 86), in general terms, gambling per se does not constitute a biomedical health problem. Where gambling is permitted, it is usually a legal consumer product which for the vast majority of participants has no discernable negative externalities. However, for a minority of individuals and indeed for some population groups and/or communities, the extent of gambling participation can become problematic and its consequences far reaching.

Such circumstances appear to render gambling in a similar public health basket to that of alcohol or fast food consumption in contrast to tobacco consumption or AIDS. Alcohol and fast food are widespread, legal, and generally safe consumer products when utilised in a responsible and moderate fashion, but both have come under serious scrutiny from public health and medical researchers due to the potential for undesirable consequences of excessive consumption. However, gambling stands apart from these issues in public health terms. Although the definition of problem gambling adopted earlier recognises the potential for harm beyond the scope of the individual gambler, it remains rooted in an understanding based upon the behaviour of the individual gambler. It is arguable, however, that the impacts of gambling and whether they

constitute health issues or not is contingent more upon local circumstances of individuals rather than upon any objective behavioural benchmark or criterion. This is because there is no universal point at which benign gambling behaviour can logically be demarcated from problem gambling behaviour. In contrast, excessive fast food or alcohol consumption will rapidly lead to measurable deteriorations in the health of overindulgent individuals, regardless of their personal or environmental contexts. There are also relatively clear indicators of what constitutes overweight or intoxicated and what the side effects are likely to be. Extending this argument to problems at a wider community level, neighbourhoods with high rates of poor diet or alcohol consumption in the population will also have high levels of associated diseases and other health problems. No such measures or benchmarks exist for gambling. An acceptable level of gambling for most people may be a major problem for some. What is problematic gambling behaviour in one context may be nonproblematic in another context. Whilst some efforts are being made to develop responsible gambling limits (Currie, Hodgins, Wang, El-Guebaly, & Wynne, 2008), which might then be utilised for consumer protection purposes, such limits are in a developmental stage. Arguably, such measures will never apply to all gamblers or all communities in all circumstances.

Better understanding of the circumstances in which gambling activity may be problematic, both at an individual and at a community level, thus emerges as an important issue. Despite this, risk factors for problem gambling are often attributed only to individuals rather than their environmental or social influences, as is the case for many other public health issues (Diez-Roux, 1998, p. 216). This has certainly been evident with regards to gambling and problem gambling. A substantial body of the current research into problem gambling tends to follow the medicalised model (Wheeler et al. 2006, p. 86), either explicitly or implicitly. As such, much research has been directed towards the psychological and neurobiological understanding of gambling. Problem gambling prevention and treatment approaches have thus been dominated by such approaches. However, in Australia and some other jurisdictions (e.g., Canada, New Zealand), problem gambling is increasingly being addressed from a public rather than an individual health perspective. Responsible gambling policies which encompass consumer protection, education, and community awareness facets are common (Dickerson, 2003, p. 29). This is because, as is the case for many public health problems, biomedical explanations of problem gambling alone are insufficient and thus are not suited for treatment, management, and prevention objectives (Moon, 1995, p. 2). Indeed, for some issues (e.g., obesity), it is widely agreed that environmental rather than biomedical explanations are most applicable (Hill, Wyatt, Reed, & Peters, 2003, p. 853). This is a very important step because the logical correlate of the doctrine that individuals hold the key to their own health is that research is best conducted on the individual rather than on groups, because it is individuals who truly influence their personal well-being (Diez-Roux, 1998, p. 216). Research which assumes that individual risk factors are at the heart of health problems is likely to overlook important sociological and environmental processes and may result in approaches which don't provide the best possibility for a remedy (Link & Phelan, 1995, p. 90). Whilst gambling is increasingly being understood from this perspective, there has to date been little attempt to understand exactly how the environmental circumstances interact and influence gambling and its public health outcomes.

The role of the local environment — Contextual and compositional factors

The public health concepts of compositional and contextual influences are useful for examining the influence of local area dynamics on variations in gambling-related problems. Compositional factors are those related to characteristics of the area's population, whereas contextual features refer to the social and physical environment in which the subjects live (Reijneveld, 1998, p. 33). As Frohlich, Potvin, Gauvin, and Chabot (2002, p. 155) note, a growing body of research has emerged focussing on the respective contributions of contextual and compositional effects in public health research. They cite many examples. Whilst compositional and contextual influences are inextricably linked, it is still important to distinguish between them (Curtis & Rees Jones, 1998, p. 647). This is because a purely compositional explanation would posit that the sorts of people who live in a given area determine what their behaviours are, whereas a contextual explanation would highlight features of the environment which influence their actions (Curtis & Rees Jones, 1998, pp. 647–648; Ecob & Macintyre, 2000, pp. 261–262). Such contextual variables, also known as group, ecological, macro, and aggregate variables (Diez-Roux, 1998, p. 217), are assumed to have an effect on individuals' behaviour over and above their own characteristics (Frohlich et al., 2002, p. 156). However, as Curtis and Rees Jones (1998, p. 655) observe, many of the processes of contextual and compositional influences on health are self-reinforcing and thus need to be viewed together.

To explain why gambling problem prevalence varies between regions, a compositional approach might focus on the people in the regions and their sociodemographic characteristics. Whilst most gambling studies report that the characteristics of individuals experiencing problems tend to reflect the socioeconomic and demographic characteristics of the population overall, numerous studies have identified specific groups which appear to be slightly more heavily represented. These include people who are separated, divorced, unemployed, and from single-person households (Productivity Commission, 1999, p. 6.56); people from lower socioeconomic groups (Welte, Barnes, Wieczorek, Tidwell, & Parker, 2001); young people (Productivity Commission, 1999, p. 6.55; Shaffer, Hall, & Vander Bilt, 1997, p. iii); and people from immediate family environments with drug, alcohol, and/or gambling problems (Queensland Government Treasury, 2001, pp. 2–3). Therefore, small area variations evident in gambling activity and/or problems might reflect spatial differences in these sociodemographic characteristics of the population.

In contrast, a contextual approach to understanding spatial variations in gambling problems would ask what environments (e.g., types of gambling on offer, regulatory measures, size and number of venues, and alternative recreational activities in the region, to name just a few) tend to be more conducive to the emergence of gambling problems than others. To this end, gambling researchers have long argued that increased availability and accessibility to gambling products leads to an increase in the prevalence of problem gambling (Abbott & Volberg, 1999, p. 108). The links between gambling, problem gambling, and accessibility to gambling have been examined in a number of recent studies (e.g., Productivity Commission, 1999; Marshall, 2004; Marshall, McMillen, Niemeyer, & Doran, 2004; Ministry of Health, 2008; Wheeler et al., 2006), all of which have found evidence of positive relationships. While these relationships are complex and multidimensional, with accessibility being influenced by

a wide range of factors (e.g., social, spatial, cultural, and economic, among others), the most common finding has been that regions with relatively high concentrations of gambling facility supply tend to have higher levels of gambling activity amongst the local population.

Such findings are reflective of other public health issues. Indeed, a growing body of evidence suggests that public health outcomes for a range of issues are affected to a degree by the local characteristics of place. Widespread obesity, for example, is a concern which has been in part blamed on the ready availability of fast foods (e.g. Reidpath, Burns, Garrard, Mahoney, & Townsend, 2002), whilst excessive alcohol consumption is linked to a wide range of physical and mental health issues and has also had the availability of the product highlighted as a possible risk factor (e.g., Gruenewald, Remer, & Lipton, 2002; Weitzman, Folkman, Folkman, & Wechsler, 2003; Livingston, 2008a, 2008b). Such findings are not surprising because the general public and its actions and behaviours are influenced by a wide range of social, economic, cultural, and environmental factors and are not simply driven by individual characteristics such as genetics, access to services, and education (Burris, Kawachi, & Sarat, 2002; Burris, Lazzarini, & Gostin, 2002; Reynolds, 1995). There is no logical reason why such a range of determinants should not also apply to gambling behaviour.

Local influences on public health outcomes of gambling

Neoregional geography recognises that local-level phenomena are complex outcomes of regional, national, and global forces interacting with and within the local complexities of any given place (Jarosz, 1996, pp. 42–45; Marshall, 1996, p. 24; Murphy, 1991, p. 25; Urry, 1986, p. 239). Therefore, although the impact of heightened levels of gambling experienced by state and national economies may be reflected at the local level, the precise character of the final impact will depend upon a range of issues and characteristics unique to that place (Marshall, 1996, p. 24). Essentially, then, the understanding outlined here recognises that public health implications of gambling activity are unlikely to manifest uniformly in a straightforward manner. There will not be a standard range of problems across the board for an entire nation, state, or indeed community when a new gambling industry emerges. The emergence of gambling-related problems — indeed whether they emerge at all; their extent, type, and severity; and the capacity and way in which they are responded to in any given community — will be critically dependent upon the configuration of contextual and compositional features of the local area.

On the basis that public health issues function along a continuum from the roots of a problem through the emergence and nature of a problem and ultimately to the remedy of the problem, in general terms, local circumstances — both contextual and compositional — can influence public health outcomes of gambling in three broad ways along the continuum:

- *They create the conditions* in which the problem can first emerge (e.g., presence and type of gambling opportunities and how they are regulated).

- *They influence the gambling activity and behaviour in the area* and thus the type, extent, and severity of gambling-related problems.

- *They affect the response capability* with which the community can/does deal with emergent problems.

In other words, the impact of local level factors on public health outcomes of gambling is not confined to a single point on the public health continuum. The presence of gambling facilities or even high levels of gambling activity in a community will not automatically lead to public health problems in a passive relationship. Simply because gambling opportunities are present and being used by the local population does not necessarily mean that problems will emerge. Rather, the ultimate public health outcomes of gambling in an area depend upon the cumulative impact of relevant contextual and compositional factors as they manifest over time and at different points on the continuum. For example, when considering the compositional factor of economic well-being, high levels of gambling expenditure are less likely to result in public health concerns if the expenditure can readily be sustained by those involved (i.e., those who can afford it). In contrast, relatively low gambling participation rates amongst many households in poor neighbourhoods may lead to heightened local public health concerns. Even within the same area, harms can occur across the community in different ways (Gruenewald et al., 2002, p. 47), depending upon the characteristics of the individuals who are gambling and the cumulative and multiplier effects on their families, friends, and colleagues. However, if the local community has high levels of resilience and a capacity to respond to emergent problems, the implications may be less severe. As Macintyre, Maciver, and Sooman (1993, p. 221) suggest, the extent of community integration and political activism, the reputation of the area, and the ability to generate community spirit can all influence the local capacity to improve conditions or attract services and facilities.

Another issue which needs to be recognised is that different compositional factors could influence outcomes in different ways depending on contextual variables (Curtis & Rees Jones, 1998, p. 648). For example, ethnicity may have a different influence in a minority context than occurs in a majority situation (Curtis & Rees Jones, 1998, p. 648). Such a situation has been recognised in recent gambling research. Scull, Butler, and Mutzleburg (2003, pp. 43–47) point to the possibility that recently arrived migrants may see gambling as a means by which to become involved in mainstream society or perhaps use it as an expression of freedom, particularly if gambling was banned in their homelands. In other cases, compositional characteristics might act as a mediator. This is because different population groups can be subjected to different socioregional influences than others (Karvonen & Rimpelä, 1996, p. 1473). For example, Frohlich et al. (2002, p. 164) proposed a recursive relationship between compositional and contextual factors in the uptake of smoking in an area — characteristics of the population reinforce the contextual features of the neighbourhood through increased outlets, advertising, or availability of the product. They go on to suggest that the local social structure is an arrangement of compositional and contextual chances which interact recursively to provide the overall environment in which adolescents are exposed to and take up smoking (Frohlich et al. 2002, p. 164). Evidence from Australia suggests similar outcomes are occurring in the supply and consumption of gambling. The relationship previously identified between gaming machine expenditure and gaming machine provision has also been found to have a socioeconomic element — namely higher concentrations of machines and expenditure on the machines in many less advantaged neighbourhoods (e.g., Doughney & Kelleher, 1999; Livingstone, 2001; Marshall, 1999; Marshall & Baker, 2001a; Productivity Commission, 1999). However,

explanations for this outcome have been contradictory. As Marshall and Baker (2001b) discuss — in relation to Melbourne, Australia — numerous factors influence these relationships, for example, the composition of the local populations or the contextual features of the environment.

Responding to public health outcomes of gambling

As Macintyre and Ellaway (1998, p. 94) argue, when framing health and welfare policies, account should be taken of the differential access to and uptake of potential health-promoting activities amongst different social groups and, importantly, areas. Just as the environment promotes obese lifestyles through the provision of frequent opportunities to purchase large quantities of cheap, highly palatable, and energy-rich food (Hill & Peters, 1998, p. 1371), the omnipresence of easy-to-use, socially accessible, and cheap forms of gambling can be implicated as one factor leading to overconsumption of the product and thus the emergent public health concerns in some places.

If it is accepted that local circumstances are an important factor influencing population gambling behaviours and related problems, the logical outcome of this is that public health issues will differ from place to place and thus responses to public health problems need to recognise that difference. However, in general, regulations and harm minimisation policies for public health concerns tend to be implemented at a global level (Gruenewald & Treno, 2000, p. s538). Whilst this may be a suitable approach for public health concerns which do not differ in nature from place to place, gambling does not fit into standard public health frames with objective measures of what constitutes a problem and what does not. As has been outlined here, depending on the particular issue, different responses may be appropriate for different areas and for different groups and may depend on a range of issues. Whether the problem is uniformly experienced, uneven but widespread, or locally severe might all have an effect on the response required (Ecob & Macintyre, 2000, p. 273). In some circumstances and under certain conditions, global or regional interventions may be most appropriate, whilst in other situations local responses may be best (Gruenewald & Treno, 2000, p. s542). As Reijneveld (1998, p. 38) argues, efforts to improve specific public health outcomes in communities need to consider the existence of contextual effects. Regardless of whether responses are local or global, the arguments presented here suggest that improvements to public health should not involve just the targeting of individuals but also needs to treat the local environment (Duncan, Jones, & Moon, 1999, p. 503; Hill & Peters, 1998, p. 1371; Karvonen & Rimpelä, 1996, p. 1474; Reijneveld, 1998, p. 33).

Greater attention must therefore be paid to basic social and environmental conditions if public health reforms are to have maximum effect (Macintyre et al., 1993, p. 219; Link & Phelan, 1995, p. 80). Such sentiments must also apply to initiatives addressing gambling-related problems. Whilst such an argument does not nullify approaches which target individuals experiencing gambling problems, it should be recognised that measures which target only individuals may not be effective if aspects of the local physical and social environment which influence the problems are not simultaneously targeted (Curtis & Rees Jones, 1998, p. 668). Indeed, it may well be most effective to 'cure' the environment first (Hill & Peters, 1998, p. 1371). Improving the contextual conditions in which residents live could lead to healthier behaviours or, at the very least, less unhealthy activity (Macintyre et al., 1993, pp. 229–230). Indeed, it is

plausible to argue that aspects of the local environment provide the best possible means by which to have an effect through policy and regulatory approaches. This is because developing policy designed to influence the gambling behaviour of populations and individuals will be quite difficult and in some circumstances impossible if the environment in which they are living does not change.

Conclusion

As this paper has argued, gambling and problem gambling are growing worldwide issues which warrant serious attention as a potential public health concern. As with other public health problems, the implications of gambling in any given community will depend upon a multitude of environment/behaviour relationships occurring at a local level. However, unlike other public health issues, it is these relationships, rather than any straightforward measure of the level of gambling activity occurring, which determine whether gambling is in fact a problem in any given area. This is because the emergence of public health problems in any given region will depend not only upon the type or size of gambling facilities operating in the region, nor only upon the level of gambling activity or individual gambling behaviours in the region. Rather, whether gambling leads to public health problems in a region will depend upon the relationships between the gambling facilities, the gambling activity, and the compositional and contextual circumstances of individual gamblers and the local community. The consequences of gambling and whether problems emerge are thus entirely dependent on the circumstances of the individual(s) or communities involved and not upon the level of gambling activity or type of behaviour.

In communities with newly established gambling facilities, Marshall (1996) argues that the preexisting social and economic conditions of a region are likely to be critical in determining the ultimate outcome for the region. Specifically, precincts with preexisting social and community problems may provide the platform for more severe implications of gambling activity, particularly if the local population is the primary source for the revenue. In cases where gambling facilities cater predominantly to tourists, outcomes are likely to be very different (Eadington, 1995, p. 4). However, during the current phase of gambling proliferation largely involving gaming machines, it has been well identified in parts of Australia (Marshall & Baker, 2001a) and elsewhere (e.g., New Zealand (Wheeler et al., 2006) and Canada (Gilliland & Ross, 2005)) that gaming machines tend to be disproportionately sited in disadvantaged locales. This situation could potentially be influencing the emergence of higher levels of gambling-related problems in areas which can least afford them, and amongst populations that have a lesser capacity to respond to them (Wheeler et al., 2006, p. 95).

However, this does not suggest that problems will always emerge in less-advantaged areas with higher concentrations of gambling facilities. This is because processes influencing experiences and outcomes may operate differently in different places (Curtis & Rees Jones, 1998, p. 645). In other words, it should not be expected that similar circumstances in two distinct places will result in similar outcomes. There may be mediating factors which result in one set of outcomes in one location and a quite different range of consequences in another. Alternatively, it should not be considered unusual for vastly different circumstances to produce very similar results. This is supported by Marshall's (2002, p. 260) examination of gambling at a local level in Australia, which reported vastly different levels of gambling activity amongst

populations with similar compositional characteristics but living in different gambling supply environments. As such, public health approaches need to recognise these possibilities and be prepared to tailor solutions and approaches to suit the local circumstances and conditions of the communities for which they are designed. Strategies which target both the persons experiencing gambling problems and the circumstances which led to those problems, and which can adjust to the dynamic nature of a proliferating gambling environment, are likely to be critical to addressing public health harms associated with gambling.

Acknowledgements

Thanks to the two anonymous referees and to Professor Robert Bush, who all provided helpful feedback on earlier versions of this manuscript.

References

Abbott, M., & Volberg, R. (1999). *Gambling and problem gambling in the community: an international overview and critique* (Report Number One of the New Zealand Gaming Survey). Wellington: Department of Internal Affairs.

Burris, S., Kawachi, I., & Sarat, A. (2002). Integrating law and social epidemiology. *The Journal of Law Medicine and Ethics, 30* (4), 510–521.

Burris, S., Lazzarini, Z., & Gostin, L. (2002). Taking rights seriously in health. *The Journal of Law Medicine and Ethics, 30* (4), 490–491.

Centre for Population Studies in Epidemiology. (2001). *Gambling patterns of South Australians and associated health indicators.* South Australia: Strategic Planning and Policy Division — Department of Human Services.

Cohen, D., Spear, S., Scribner, R., Kissinger, P., Mason, K., & Wildgen, J. (2000). Broken windows and the risk of gonorrhea. *American Journal of Public Health, 90* (2), 230–236.

Currie, S., Hodgins, D., Wang, J., El-Guebaly, N., & Wynne, H. (2008). In pursuit of empirically based responsible gambling limits. *International Gambling Studies, 8* (2), 207–227.

Curtis, S., & Rees Jones, I. (1998). Is there a place for geography in the analysis of health inequality? *Sociology of Health and Illness, 20* (5), 645–672.

Dickerson, M. (2003). Exploring the limits of 'responsible gambling': Harm minimisation or consumer protection. *Gambling Research, 15* (1), 29–44.

Diez-Roux, A. (1998). Bringing context back into epidemiology: Variables and fallacies in multilevel analysis. *American Journal of Public Health, 88* (2), 216–222.

Doughney, J., & Kelleher, T. (1999). *The impact of poker machine gambling on low-income municipalities* (unpublished report). Melbourne: Workplace Studies Centre, Victoria University.

Duncan, C., Jones, K., & Moon, G. (1999). Smoking and deprivation: Are there neighbourhood effects? *Social Science and Medicine, 48,* 497–505.

Eadington, W. (1995). Economic development and the introduction of casinos: Myths and realities. In J. O'Conner (Ed.), *High stakes in the 90s*. Fremantle, Western Australia: Sixth National Conference of the National Association of Gambling Studies, Curtin University.

Ecob, R., & Macintyre, S. (2000). Small area variations in health related behaviours: Do these depend on the behaviour itself, its measurement, or on personal characteristics? *Health and Place, 6,* 261–274.

Frohlich, K., Potvin, L., Gauvin, L., & Chabot, P. (2002). Youth smoking initiation: Disentangling context from composition. *Health and Place, 8,* 155–166.

Gilliland, J., & Ross, N. (2005). Opportunities for video lottery terminal gambling in Montreal. *Canadian Journal of Public Health, 96* (1), 55–59.

Gruenewald, P., Remer, L., & Lipton, R. (2002). Evaluating the alcohol environment: Community geography and alcohol problems. *Alcohol Research and Health, 26* (1), 42–48.

Gruenewald, P., & Treno, A. (2000). Local and global alcohol supply: Economic and geographic models of community systems. *Addiction, 95* (Supplement 4), s537–s549.

Hames Sharley. (1997). *Impact of electronic gaming machines on small rural communities*. Melbourne: Victorian Casino and Gaming Authority.

Hill, J., & Peters, J. (1998). Environmental contributions to the obesity epidemic. *Science, 280,* 1371–1374.

Hill, J., Wyatt, H., Reed, G., & Peters, J. (2003). Obesity and the environment: Where do we go from here? *Science, 299,* 853–855.

Jarosz, L. (1996). Working in the global food system: A focus for international comparative analysis. *Progress in Human Geography, 20* (1), 41–55.

Karvonen, S., & Rimpelä, A. (1996). Socio-regional context as a determinant of adolescents' health behaviour in Finland. *Social Science and Medicine, 43* (10), 1467–1474.

Korn, D. (2002). Examining gambling issues from a public health perspective. *Journal of Gambling Issues, 4*.

Korn, D., & Shaffer, H. (1999). Gambling and the health of the public: Adopting a public health perspective. *Journal of Gambling Studies, 15* (4), 289–365.

Link, B., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of Health and Social Behaviour, 36* (Extra Issue), 80–94.

Livingston, M. (2008a). Alcohol outlet density and assault: A spatial analysis. *Addiction, 1003,* 619–628.

Livingston, M. (2008b). A longitudinal analysis of alcohol outlet density and assault. *Alcoholism: Clinical and Experimental Research, 32* (6), 1074–1079.

Livingstone, C. (2001). *Regional caps on poker machine numbers: Impacts, potential impacts and issues*. Melbourne: Australian Institute for Primary Care — La Trobe University.

Macintyre, S., & Ellaway, A. (1998). Social and local variations in the use of urban neighbourhoods: A case study in Glasgow. *Health and Place, 4,* 91–94.

Macintyre, S., Maciver, S., & Sooman, A. (1993). Area, class and health: Should we be focussing on places or people? *Journal of Social Policy, 22* (2), 213–234.

Marshall, D. (1996). *Putting pokies in place: A consideration of the costs and benefits of pokies since their introduction to South Australia — The case of Peterborough, Adelaide.* Unpublished thesis, Flinders University of South Australia.

Marshall, D. (1998). Missing the jackpot? The proliferation of gambling in Australia and its effect on local communities. *Australian Geographical Studies, 36* (3), 237–247.

Marshall, D. (1999). Adelaide's pokie geography: Distribution of, and expenditure on, electronic gaming machines in Adelaide. *South Australian Geographical Journal, 98,* 19–29.

Marshall, D. (2002). *A geography of gambling: Electronic gaming machines in Richmond-Tweed, Armidale*. Unpublished PhD dissertation, University of New England.

Marshall, D. (2004). Gambling, public health and the role of the Federal Government. *Australian Journal of Primary Health, 10* (1), 56–63.

Marshall, D. (2005). The gambling environment and gambler behaviour: Evidence from Richmond-Tweed, Australia. *International Gambling Studies, 5* (1), 63–83.

Marshall, D., & Baker R. (2001a). Clubs, spades, diamonds and disadvantage: The geography of electronic gaming machines in Melbourne. *Australian Geographical Studies, 39* (1), 17–33.

Marshall, D., & Baker, R. (2001b). Unfair odds? Factors influencing the distribution of electronic gaming machines in Melbourne. *Urban Policy and Research, 19* (1), 77–92.

Marshall, D., & Baker, R. (2002). The evolving market structures of gambling: Case studies modelling the socioeconomic assignment of gaming machines in Melbourne and Sydney, Australia. *Journal of Gambling Studies, 18* (3), 273–291.

Marshall, D., McMillen, J., Niemeyer, S., & Doran, B. (2004). *Gaming machine accessibility and use in suburban Canberra: A detailed analysis of the Tuggeranong Valley*. Canberra: ACT Gambling and Racing Commission.

Melbourne Institute of Applied Economic and Social Research, Deakin Human Services Australia, & National Institute of Economic and Industry Research. (1997). *Impact of gaming venues on inner city municipalities*. Melbourne: Victorian Casino and Gaming Authority.

Ministry of Health. (2008). *Raising the odds? Gambling behaviour and neighbourhood access to gambling venues in New Zealand*. Wellington: Ministry of Health.

Moon, G. (1995). (Re)placing research on health and health care. *Health and Place, 1*, 1–4.

Murphy, A. (1991). Regions as social constructs: The gap between theory and practice. *Progress in Human Geography, 15* (1), 22–35.

Neal, P., Delfabbro, P., & O'Neil, M. (2005). *Problem gambling and harm: Towards a national definition*. Melbourne: Ministerial Council on Gambling.

Office of Economic and Statistical Research. (2007). *Australian gambling statistics 1980–81 to 2005–06*. Brisbane: Queensland Treasury.

Productivity Commission. (1999). *Australia's gambling industries* (Report No. 10). Canberra: Ausinfo.

Queensland Government Treasury. (2001). *Queensland household gambling survey 2001*. Brisbane: Queensland Government.

Raento, P., & Berry, K. (1999). Geography's spin at the wheel of American gambling. *The Geographical Review, 89* (4), 590–595.

Reidpath, D., Burns, C., Garrard, J., Mahoney, M., & Townsend, M. (2002). An ecological study of the relationship between social and environmental determinants of obesity. *Health and Place, 8*, 141–145.

Reijneveld, S. (1998). The impact of individual and area characteristics on urban socioeconomic differences in health and smoking. *International Journal of Epidemiology, 27*, 33–40.

Reynolds, C. (1995). *Public health law in Australia*. Sydney: The Federation Press.

Scull, S., Butler, D., & Mutzleburg, M. (2003). *Problem gambling in non-English speaking background communities in Queensland: A pilot study*. Brisbane: Queensland Government Treasury.

Shaffer, H., Hall, M., & Vander Bilt, J. (1997). *Estimating the prevalence of disordered gambling behavior in the United States and Canada: A meta analysis*. Boston: Harvard Medical School Division on Addictions.

Urry, J. (1986). Locality research: The case of Lancaster. *Regional Studies, 20* (3), 233–242.

Walker, M. (1996). The medicalisation of gambling as an addiction. In J. McMillen (Ed.), *Gambling cultures, studies in history and interpretation*. London and New York: Routledge.

Weitzman, E., Folkman, A., Folkman, M., & Wechsler, H. (2003). The relationship of alcohol outlet density to heavy and frequent drinking and drinking-related problems among college students at eight universities. *Health and Place, 9*, 1–6.

Welte, J., Barnes, G., Wieczorek, W., Tidwell, M-C., & Parker, J. (2001). Alcohol and gambling pathology among U.S. adults: Prevalence, demographic patterns and comorbidity. *Journal of Studies on Alcohol, 62* (5), 706–712.

Wheeler, B., Rigby, J., & Huriwai, T. (2006). Pokies and poverty: Problem gambling risk factor geography in New Zealand. *Health and Place, 12*, 86–96.

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Manuscript history: submitted September 29, 2008; accepted February 19, 2009. This article was peer-reviewed. All URLs were available at the time of submission.

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Competing interests: None declared.

Ethics approval: Not required.

Funding: Not applicable.

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